

COMPUTER WORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

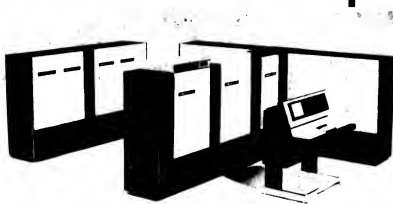
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GE Adds Faster Computer to 600 Series



GE's Largest Computer Offering to date, the GE 655 is upward compatible with the existing GE-600 line of large scale information systems.

CDC Customer Contract Grants Full Unrestrictive Rights to CDC

By Peter L. Briggs
Civ Software Editor

"It is agreed that no idea, concept, knowhow, or technique relating to data processing disclosed by the customer to [CDC] shall be deemed confidential."

"The customer grants to [CDC] an irrevocable, nonexclusive, unrestricted, worldwide, and royalty-free license, with the unrestricted right."

Does this read like something familiar? It should, since it very closely resembles the recently rewritten IBM systems engineering services agreement before it was modified by customer demand.

One user contacted CW and pointed out the dangers of such a contract and expressed his company's inability to avoid the signing of the contract without changing manufacturers.

He felt that others might feel similar reluctance to sign, when confronted with what amounts to a complete license to any computer work done by the customer on either the systems software, or in the general field of data processing.

The contract further states that "the customer recognizes and agrees that [CDC] has the right to duplicate, use, and market any and all software or parts thereof or deviations therefrom which may contain modifications or improvements to... developed by [CDC], the customer, or jointly by [CDC] and the customer, and to this end the customer hereby grants to CDC a non-exclusive, unrestricted, [etc.]."

Thus, the customer can never improve on CDC's software and then go sell it, because CDC can use it away or sell it as part of

its system.

Keep CDC in the Dark

The only way around this clause would be for CDC to never become aware of such improvements. This forces the customer to avoid using the resources available from his manufacturer to his (the customer's) benefit.

Even IBM, with its original contract, never tried to be quite so all-inclusive in its demands. They only wanted the software they helped develop. CDC wants everything!

This aspect of CDC's un-

derstanding policy was never discussed during the company's official unbundling conference. The company emphasized only the new hardware freedom. CDC says that any user can now tinker with his machine, for a price, and CDC will bail him out.

It avoided discussion of those areas where services were involved. CW was told that "These policies are not turned up yet" at that time.

Customers are not certain exactly what to do about that contract yet, but some indicated that immediate actions would be taken to ward off the impact.

Pentagon Finds New Computer Application: Fast Scapegoat

By Joseph Hanlon
CW Staff Writer

WASHINGTON, D.C. When a Pentagon efficiency expert got fired for telling about a \$2 billion contract overrun, a "computer error" got part of the blame.

But Sen. William Proxmire doesn't believe it, he charged that the computer error was contrived to cover up the firing. And a Proxmire staff aide warned: "The possibilities are unlimited for using computers as scapegoats."

Ernest Fitzgerald was a Defense Department efficiency expert. In Sept. 1968, he was promoted from an untenured position to a tenured civil service post.

He testified Nov. 13 before Sen. Proxmire's subcommittee of the Joint Economic Committee that the CSA group plan was

to cost \$5 billion rather than the \$3 billion it was supposed to.

Twelve days later, Fitzgerald was told that his promotion and tenure were revoked because they had been given as the result of a computer error.

Later he was sent to analyze the cost of a howling ally in Thailand, and finally his job was abolished for "economy reasons."

Proxmire charged that the "computer error" was just an excuse, and part of a "series of clear reprisals" against Fitzgerald.

Defense Department Public Affairs Officer Major R.J. O'Brien fired back: "The machine was programmed wrong." But after further questioning, he conceded that it was really a "people error."

PHOENIX, Ariz. General Electric has updated the current 600 line with its fastest system to date, the 655.

Twice as fast as the company's earlier model 635, the new computer is priced to compete at the upper end of IBM's line. Costing around the same as an equivalent-core 360/75, the new 655 is less expensive and less versatile than the 360/195 in terms of what a single central processor can do.

Improvements over GE's 635 are largely in the area of cycle time and instruction speed, while core is basically the same. Cycle time is halved to 0.5 μ sec. per 36-bit word, add time for a full word is 0.6 μ sec, while multiply is speeded from 7.6 to 3.0 μ sec. Storage is 256K for both machines.

Comparable Rentals

The company lists comparable "minimum configuration" rentals at \$56K per month for the 635, against \$80K for the new machine.

Users may find, however, that

prices will be a good deal higher. A 655 with full core capability and processor and two I/O control modules costs \$64K per month before any peripherals have been added.

Core is available from 32K to the full 256K words.

Aside from internal speed, the 655 looks quite similar to the older machine. In addition to core, data representation is the same, and hardware is very nearly identical, with one-address instructions still the rule.

Sixty-four I/O channels should keep any user happy, but the unchanged aggregate system transfer rate of 450,000 words/sec. may be a limiting factor in multi-channel applications.

Software

The company says that all software developed for the 635 will run without change on the new processor, including Cobol, Fortran, and Algol compilers.

Also unchanged are GE's operating system Geos-II, applications developed around the company's own software.

(Continued on Page 4)

Patent Court Finds U.S. Infringed Patent

WASHINGTON, D.C. Government infringement of a recently expired disk patent became a distinct possibility, with a preliminary government setback in a suit brought against it by Technitrol, Inc.

The suit alleges that the government is not licensed under Technitrol's 1952 patent covering a magnetic data storage system, and the trial commissioner of the U.S. Court of Patent Claims has recommended that the court conclude "as a matter of law" that government infringement did occur.

Technitrol brought suit against the government in 1964, and this year filed a class action against three major manufacturers and about 200 users [CW, July 2].

The original intent of the 1964 suit was to obtain a "test case" judgment to be followed by negotiations among individual users, according to a Technitrol spokesman.

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System/3, Part 1: The Users-to-Be Speak

Delivery Delays, Card Conversions Willingly Endured

By Frank Pianta

CW staff writer

The IBM System/3, in spite of delivery schedule slippages and card-conversion problems, seems to be winning many potential converts among unit-record users.

When IBM first announced System/3 last July, the indicated market was the small business firm. Four months later, all ap-

pearances seem to indicate that this target was a valid choice, with users of unit-record equipment looking at System/3 as a solution to their dilemma of trying to take advantage of latest technology while keeping costs in line.

With all of the attention in recent years being focused on computers, it is very easy to lose sight of the many thousands of

unit-record shops located around the country. These installations, characterized by equipment with IBM 402s, 519s, 602As and other unit-record equipment, have been supplying data processing capabilities economically to small firms.

Many unit-record users now spending \$500 to \$2,000 per month in rentals feel they can make the transition toward becoming a computer installation by installing the System/3.

CW has spoken with many of these small users and found that they think the System/3 will overcome the previous problems that prevented the upgrading of their operations.

Price Significant

Price is the most significant factor in the selection of the System/3. IBM has stated that a typical card version, including a data recorder and sorter, will rent for \$1,185 per month.

To this must be added the \$35 per month charge that has been established for the licensing of the card version of RPG II.

These prices are reasonable, according to prospective users, in comparison with their existing equipment.

Users said slippage of scheduled delivery dates was found to be fairly common. Of those contacted that had placed firm orders, the majority reported slippages of from two to seven months. This was usually ascribed to the unexpected popularity of the System/3. Most buyers seem to be quite willing to wait their turn in line, however.

Programming costs have been reduced, in the estimation of

these prospects, by the heavy emphasis that IBM has placed on the use of RPG II as a language. Here, they feel, is a language that is not too difficult to cope with, and has been sufficiently proven to be reliable.

Most of the installations have indicated that this is the only language they are planning to use, and are planning to train their own employees to use it.

The application customer service, offered by IBM in connection with the System/3, seems to have little appeal. Most of the users seem to think they can do without this aid.

The use of non-IBM software suppliers for applications packages does not seem to be very popular either.

Prospective users, questioned by CW, seem to fear the loss of control that might result from the use of a software supplier not familiar with his unit-record applications.

Space Saver

The most controversial aspect of the System/3 is the new 96-column card format. This is causing some controversy among the small users.

They have been plagued for years with the problem of insufficient storage space and see the new size card as a way out.

The cost of new storage and handling equipment will be considerable, but, as one data-processing manager put it, "It's cheaper than putting up a new building."

The attitude of the user-to-be toward the question of file conversion seemed to vary considerably. Reactions ranged from

"It's a nightmare" to "We'll just ship them to IBM and have them do it." Somewhere in the middle lies the position taken by most of the prospects. They see that the conversion process will be both extensive and expensive. Some are trying to reduce the cost, by converting to 96-column cards only the bare minimum necessary for the transitional period. Most seem to be planning to use the facilities of their local IBM center to carry out the conversion.

The new card format justifies the added expenses to many managers on the basis of increased capacity. "We've been looking for a card stretcher for years, and it looks like we've finally found one," mused one manager. He went on to say that his firm's name-and-address files were presently set up, it took three cards for each entry, with all of the increased card-handling and chances for error that multiple card sets involve. He plans to reformat this information onto one card.

All is not roses with the new cards, however. Suppliers of card-handling equipment have been active in announcing new size versions of the standard items, but some of the users are afraid that this or that pet storage device will not prove popular enough to be reissued in the new sizes, thus necessitating further changes in their procedures. One user of tabsets was told by his supplier that the product might not be compatible with the new card size. Some of the unit-record managers asked quite still another reason for ordering the System/3: "I trust IBM more."

Managers believe they are familiar with the type and calibre of the service received with unit record equipment, and expect similar support with System/3. As for other manufacturers, many of the small users echo the sentiment expressed by one man when he said that he would not consider any other but IBM because "Those other outfits are card-oriented; they're just not familiar with our problems."

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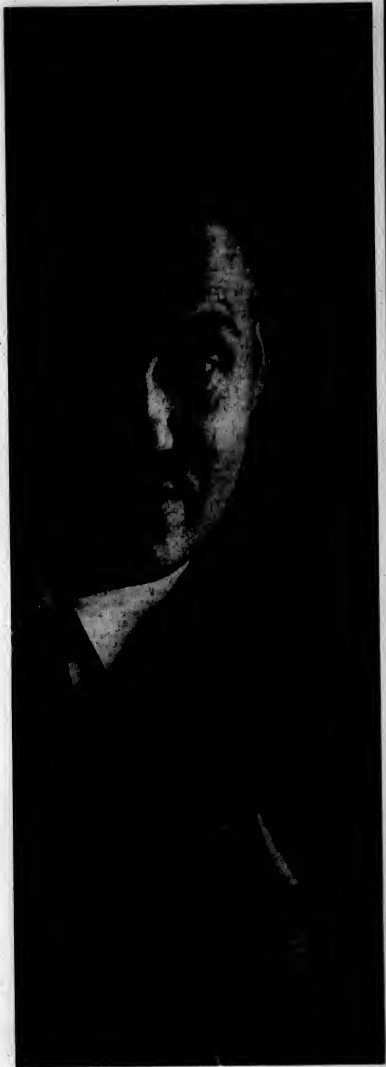
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Patent or Copyright: Part I

Users Say Program Protection 'Vital for Development'

By Edward J. Bride

Cw staff writer
WASHINGTON, D.C. — Some sort of protection is vital if software development is to continue at any reasonable pace. That was the opinion of most of the users, manufacturers, software houses, and lawyers responding to a Patent Office request for ideas on computer program patentability.

But the method of protection varied from industry-controlled

(internal) protection, to current copyright protection, and to new classes of patent regulations covering intellectual property.

No typical cross-section could be labeled, except for patent attorneys, all of whom suggested "anything but" copyright protection.

The only alternatives to a strong form of software protection are trade secrets and the hindering of development, according to many of the re-

spondents.

Only a few disagreed, claiming that protection was unnecessary, or might itself hinder software development.

A request for opinions was printed in the *Federal Office Official Gazette* on Oct. 15, 1968, but the results have just been made available.

U.S. Commissioner of Patents William J. Schuyler Jr. reported that a dozen of the 34 respondents requested that their

replies be held in confidence.

Most of the 22 who permitted the publishing of their remarks appeared concerned over both the continued availability of software, and the return for the sizeable investment, in time and effort, involved in developing new programs.

User Reaction Varies

User suggestions were extremely varied, ranging from a combination of the patent and copyright systems to the dismissal of programming as the "every-day work" of the scientific and commercial world.

Metropolitan Life said that the very patenting of programs would inhibit development and usage of programs for every-day business and commercial applications.

Metropolitan's Second Vice-President, Bert L. Neff, said that it would be inappropriate to grant a patent on a computer program, since it is no more than a mental process which is the

"every-day work" of the scientific and commercial world. Neff added that the fact that the "instructions to the computer are written in a special language does not alter their essential nature."

Western Geophysical, a division of Litol Industries, uses computers to process data in the petroleum exploration field, but derives a significant portion of its income from selling and maintaining its own programs.

The company says that patenting under existing law would be impossible to enforce and that the discovery procedure is "simply appalling."

A Western Geophysical company, Capt. H. Savit, suggested that present law, which apparently entitles programs to patent protection, should be changed so that software is protected by the copyright system (the *Court of Customs and Patent Appeals* has stated that a programmed general-purpose computer becomes a special-purpose computer, which "along with the process by which it operates, may be patented," *EW*, Aug. 37).

Avoid Withholding Technology

Bell Telephone Laboratories suggested that portions of both the patent and copyright systems are needed. Cutting the need

to ensure a return to the investor and to maximize public benefit by "promoting early dissemination of the technology involved," Bell called for the copyrighting of the program itself, but the patenting of the subject matter.

Bell's General Patent Attorney R.J. Guenther said that trade secrets would remain until the situation is clarified, resulting in the withholding of "considerable technology" from the public.

Although relatively few programs would rise to a level of patentability, Burlington Industries and Leeds and Northrup Co.'s research and development center agreed that patents are the proper form of protection.

Leeds and Northrup dismissed argument over the difficulty of enforcement, stating that it would be more advantageous to take a license under a patent rather than to infringe and build up potential liability while hoping not to be detected.

TRW systems group said that some sort of protection is "vital," with the alternative being keeping programs as trade secrets. TRW Vice-President R.B. Coperning said that copyright protection is presently insufficient, while the modification of the copyright, and not the use of a computer program.

Coperning would apparently be amenable to protection under existing law, modification of the copyright law, or current patent law.

Stripit, a division of Houliatt Industries, called for some sort of protection either through patenting of "an entire system of machine control including software" or "protecting the various software programs independently." The company deals in computerized machine control of work processes, and develops its own software.

With IBM's much-talked-about unbundling around the proverbial corner it goes into effect Jan. 1 the final decision on what form of protection, if any, will allow computer programs begins to take on additional significance.

The contents of major manufacturers' software, and of their attorneys' will be reported in the concluding article of this two-part series.

Programmatics Granted Appeal Hearing on Pi Sort Decision

By Phyllis Huggins

West Coast Bureau

LOS ANGELES — Latest round in the Programmatics/IBM legal battle over Pi Sort and IBM's sort program, the 483, results in a decision for Programmatics.

Programmatics lost the first round as the lower court ruled it was "... a little late in the game ... to enjoin IBM from distributing something which has already been out in large part," and therefore there was no basis for granting an injunction at that time. Programmatics, which became a "subsidiary" of Applied Data Research in August, appealed this decision while IBM petitioned that the appeal be denied.

The appeals court recently upheld Programmatics' request for an appeal and the case will now be heard before the New York Court of Appeals.

Pi-Sort is a proprietary program that Programmatics claims it expected to find a large market for as it worked with IBM's 450 sort and greatly speeded up results.

However, shortly after Pi Sort was announced, IBM offered to its customers without charge, an improved sort program, the 483. Programmatics claims this has cost the company its investment and threatens irreparable harm to the firm.

Programmatics' argument claims that IBM markets 400 systems a day and makes potential revenues for Pi Sort of \$18,000 a day based on the

assumption that everyone wants or requires a Pi Sort package.

Since the start of their case against IBM, Programmatics claims they have lost a potential market worth more than \$2,500,000.

They contend that every user who uses sort program, and as theirs was superior to the then existing IBM product, a good market existed.

During the initial trial, IBM stated that the 483 sort had been completed one year before it was announced.

Programmatics claims that IBM announced the 483 sort right

after Pi Sort was announced.

According to Programmatics, IBM did not announce it earlier as it would have speeded up program running time, therefore costing it rental revenues.

As there was no competitor to the existing sort program, there had been no reason to announce the new one, Programmatics says.

Since the recent unbundling announcement, IBM has stated that all new sort programs will be separately priced.

Programmatics wants the 483 sort priced separately, priced and also asks for damages.

GE Adds Faster Computer To Top 600 Series Line

(Continued from Page 1)

pany's pioneering work in management information systems and other user-written applications software.

The concept of Modular design appears to be worked out in an interesting fashion, first seen on the earlier models in the 600 series.

Instead of packaging in configuration and pricing the central processor, memory increments, and I/O controller units, GE separates them.

This is said to allow the user to build his own configuration more easily and to include multiple processors and different I/O combinations where desired.

Another beneficial fallout from this degree of modularity should include easier troubleshooting and maintenance, the company says.

Other major manufacturers' hardware offerings have some degree of modularity, at least in memory banks, but GE feels that they have carried the idea further than the others.

GE is not alone in that it has had cooperative customers willing to give it minor assistance in the field of software.

GE's close association with MIT has led to the development of a package called Moduls. MIT has been working on the cooperative development and testing of multiple-user operating systems.

Court Finds U.S. Infringed Patent

(Continued from Page 1)

When it became apparent that no judgment would be awarded for the patent expired (Sept. 23), Technitrol decided to file its class action against Control Data, Xerox (then Scientific) Data Systems, and Honeywell, plus about 200 users, suppliers, or dealers in disks.

The company spokesman is encouraged, and says that the commissioner's recommendation will lead to "meaningful negotiations" among Technitrol, the government, and any other "possible infringers." He said the company hopes for out-of-court settlements, to save time,

PHILADELPHIA

The Common Pleas Court will be assisted by a computer in maintaining efficiency and preventing future overloads.

Edward J. Blaker, court administrator, explained that the data processing center would store and implement new procedures and clerical functions dealing with criminal court files from the time the bill of indictment is processed to the final disposition.

At the end of the day, the results of all court activities, arraignments, bench warrant

hearings, post-trial motions, and bail charges, will be fed into the computers. That night, the information will be coded and updated for the next day's court agenda.

From the output of the computers, courtroom clerks will be able to line up cases, time schedules for each day, and appointments.

Blaker said the system was expected to erase delays, mistakes, and the general red tape associated with courtroom activities.



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DP Firms Boost Minority Groups

Project Enterprise Finances Small Business

By a CW Staff Writer
WASHINGTON, D.C. — Black capitalism got a boost from the computer industry when two organizations promised over \$150,000 each to sponsor a Minority Enterprise Small Business Investment Company (Mesbic).

The Sam Wyly Foundation of Dallas and Varian Associates of

Palo Alto, Calif., were among 18 Mesbic sponsors announced by Maurice Stans, secretary of commerce, as part of Project Enterprise. Stans said that he hopes to have 100 companies involved by June 1970.

Under Project Enterprise, a private corporation sets up a Mesbic with \$150,000 minimum capital. The Mesbic then loans

money to finance business projects by members of minority groups.

Each loan will be matched by a government loan of twice as much, so that each \$150,000 actually represents \$450,000 in loan funds.

Wyly Heads National Group
The Sam Wyly Foundation was

created six months ago by Sam Wyly, 35-year-old president and board chairman of University Computing Co. Wyly was recently named by President Richard Nixon to head the National Advisory Council for Minority Business Enterprise.

The foundation will concentrate its efforts among the black, Mexican-American, and American Indian groups in the Southwest. The Mesbic has not been set up yet, but the foundation itself has guaranteed \$200,000 in bank loans to set up seven minority businesses.

The foundation also supports Ventures Advisors, a black group that provides technical and managerial assistance to these firms, and does feasibility studies of new proposals for funding.

Grants for Minority TV

In addition to funding new minority businesses, the foundation has also attempted to improve the coverage of minority groups on television. It gave a \$100,000 grant to set up a public affairs division of a local



UCC President Sam Wyly

television station, paid for the production of a series of ten 20-second color TV spots called "This Is Your Heritage" on the cultural contributions of Mexican-Americans in the U.S., and sponsored a television series "The Spirit of Blackness."

The other computer firm funding a Mesbic is Varian Associates. According to John Wilcox of Varian, they have already funded several new businesses in the Palo Alto area.

Dog Bit and Ran, But Woman Avoids Rabies Shots With Detective Computer

By Peter F. Carr
CW Staff Writer
CINCINNATI, Ohio — Although they are totally unaware of it, all the dogs in Cincinnati have their descriptions registered on tape in the city's computer center.

This by-product of the city's computer system was designed to issue new licenses by computer printout in order to save the city from having to type up the licenses manually.

However, a new use was found for the system recently, and it resulted in a happy ending to the mystery of a suburban Cincinnati woman and a dog that bit and ran.

Curly, a six-month-old beagle puppy, was lying unconscious in the roadway after being struck

by an auto. Mrs. Glenda Egloff, a 29-year-old Delhi woman, saw Curly and stopped her car to move him out of the way. But Curly recovered just in time to nip Mrs. Egloff's finger and scamper off.

Being well aware of the painful series of rabies shots given when a dog cannot be located, Mrs. Egloff enlisted the Hamilton County Regional Crime Information Center's computers to help find Curly.

Since his description and identification number and the name and address of his owner were all on tape it was simply a matter of pulling out his record by using the right modifiers. In this case the modifiers were the zip code, the breed, coded by a number, and the color, coded by a letter.

All this information was entered by punchcard into one of the three Spectra 70 computers in the Center.

The computer printed out a list of 368 dogs in the area, all of which fit Curly's general description. By further pinpointing the exact location in which Mrs. Egloff was bitten, information on 15 beagles came back.

About 38 police stations in the Cincinnati area are on line to the city's computer-center and the list of dogs was immediately transmitted to the station in the appropriate area.

In a few hours Curly had been found by process of elimination. His owner had already inoculated him, so a happy Mrs. Egloff was informed that she wouldn't have to get her rabies shots after all.

Jack O'Brien says, "Progress reports are available on demand with Brandon RMS!"

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Schedule of Technical Briefings

- DALLAS January 15
- ST. LOUIS January 8
- ATLANTA January 6
- CINCINNATI December 8
- PITTSBURGH December 11
- MIAMI January 13

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Increased Computer Usage Advocated for Medi-Cal

SACRAMENTO, Calif. — Doctors from several local medical foundations here have recommended increased use of computers to police patients and doctors participating in the state's big Medi-Cal program.

They suggested that computers be programmed to provide a detailed medical history for each Medi-Cal recipient and every provider of medical services. The intent is to determine whether treatment is justified for the patient and usual for the doctor.

Dr. Donald Harrington, presi-

dent of the San Joaquin chapter of the United Foundation For Medical Care, said that claims are currently processed without such profiles. Harrington said that if questions arose a claim might not be paid.

Use of detailed profiles for patients and doctors has proven successful in experimental programs in Sonoma, Kern, and Fresno counties, as well as in his own area, Harrington said. The foundation made its proposals to the California Department of Health Care Services. They are reviewing the plan.

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As a high school junior, Bruce Zak explains his computer science project at the Chicago City Science Fair.

Chicago Youth Programs at 13, Designs Award Winning Device, Studies at MIT

By H.L. Miller
Special to Computerworld
CHICAGO — As a 17-year-old youngster, Bruce Zak, a Chicago high school student, went to a small office each day to work as the youngest computer programmer at the Illinois Central Railroad's Main Central department in the Windy City.
Zak, a graduate of Taft High School, had developed an interest in mathematics and railroads early in life, along with a

keen appreciation of automation. "When I was six," Bruce recalls, "I began to plan signal and switching circuits, some of them rather sophisticated for a 6-year-old. Later I was ill for some months; watched TV College on Channel 11 and picked up quite a bit of mathematics that way."

13-Year-Old Programmer

"Four years ago, at age 13, I learned to program a computer

at the Illinois Institute of Technology."

Bruce was taught the rudiments of his first computer language, Fortran IV, during the first half-hour of his trip to IIT's computation center. Other languages soon followed, including COBOL, ITRAN, MAP, 360 Assembly and I/O SPS.

"My interests were primarily in symbolic logic as it applied to basic computer circuitry." On a very modest budget and his grade school exposure to electronics and math, Bruce designed numerous science fair, award-winning electronic devices.

Computer Builder

By his senior year, Zak's project consisted of a full-fledged relay-operated computer, designed on the basis of a 4-valued logic system. It had a small amount of relay memory, two I/O channels, control, and logic circuitry.

Its time base was a microprogram cut onto a Hollerith card. The card, fastened to a tin can, flexwood, and the holes were sensed by paper clips making contact to the can. A similar technique was used to sync the I/O channels. They even had error recovery.

For participation in science fairs, Bruce was awarded a \$1,000 scholarship by International Harvester Co.

Scholarship Winner

Zak came to the attention of a DeCamaro, vice-president of information and control systems for Illinois Central when he won a full scholarship at MIT in a nationwide competition.

On the college entrance examinations in math, he scored 800, highest score possible.

As part of his job interview at Illinois Central, DeCamaro gave Bruce a problem in math which takes the usual applicant half an hour to solve with paper and pencil. Bruce solved it in his head in about two minutes.

Zak held a regular job as a computer programmer in the railroad's methods, systems design and programming department.

His special project was to write a graphic subroutine; to design a program to produce weekly charts of terminal performance at various yards.

These are now produced by hand. Via Bruce's program, more than 400 charts, all more accurate than those hand-drawn, will be produced in two hours on the computer.

At MIT, besides the regular freshman courses, Bruce was in a seminar on urban systems where he used the language Transim on a 360/67 to model the Boston traffic system, and he took courses in automata theory and the design of digital systems.

Bruce intends to go into a 5-year program leading to degrees in both math and electrical engineering.

He hopes to go to graduate school at a science and math-oriented university and, "perhaps I'll have the opportunity to study abroad."

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Editorials

Users to Be Taken Again!

It would appear that CDC is following in the footsteps of IBM with a support services agreement that gives CDC all the benefits of any work done by either the customer or by the customer in conjunction with CDC.

IBM backed down on its attempt after only a few weeks, but CDC seems determined to forge ahead.

According to the terms of the CDC contract, software or inventions relating to data processing are irrevocably ceded to CDC for its use as it sees fit.

This practice, long in disrepute in other industries such as electronics, has finally come up to haunt the computer industry. Previous attempts, on the part of many manufacturers of industrial equipment, have been made to enforce such agreements. The courts, CW was told, have refused to uphold such practices.

IBM has changed its systems engineering services agreement to eliminate this confiscatory clause, and has re-interpreted the intent of the agreement to clarify customer rights to privacy.

Rumors indicate that several other manufacturers may be planning similar contracts.

When a consulting firm develops software or programs for a client, all rights to that package reside with the customer unless he specifically states otherwise.

The manufacturers force a client, if he wishes support services, to give over all such rights. The company also forces any improvements in system software, etc. to be ceded over to CDC, for its use.

These manufacturers have been duly and well paid for their services. They have received all due recompense.

By what right do they demand the use of, and the rights to, such materials?

Would More Time Help?

The French have developed an interesting technique to bypass the problems of large computer and electronics shows — the exhibit part of the show goes on for about 10 days, and the technical portions are broken down, by type, into one- or two-day sessions.

This would eliminate two of the principal problems presently plaguing JCCs. Hotel accommodations and transportation planning could be distributed over a reasonable period of time. The tremendous bottleneck at airports and hotel reservation desks could be bypassed.

In addition, technical people, who certainly cannot get away for 10, or even four, days, could attend that portion of the show that involved their specific technical areas.

They would have adequate time and space to view the exhibits, they would be able to find a place to sleep, and they might even have time to participate seriously in the technical presentations. There would be more interest, on the part of those present, in the specific technical subjects "active" for that day, and they could discuss such subjects with others with similar interests. This approach appears to offer only one serious drawback. Tan days could be pretty expensive for the exhibitors.



'I Thought Computers Were Supposed to Speed Things Up.'

Viewpoint: Thoughtful Destruction?

Use of Computers Should Benefit People

By Joseph Hanlon

CW Staff Writer

Some will view the attack on the Dow Chemical computer center (CW, Dec. 3) as the first by the new Luddites. But the Luddites smashed machines in an effort to turn back progress; the Dow attackers are far more sophisticated; they erased tapes but did not damage the machines.

"We destroyed information and knowledge that it used against people. The machine was not damaged in hopes that they can be used to benefit people," explained Jo Ann Muleri, a member of Beaver 55, the group that erased the tapes.

But the specific contents of those tapes are unimportant. In a dramatic way, Beaver 55 has

stressed a point we often miss: computers have done very little to really benefit people or improve the quality of life.

Even in hospital systems, often cited as the most humanitarian use of computers, the stress has been on accounting and billing. Medical systems have run a poor second.

Beaver 55 has hit a raw nerve in our society. Many people who do not support their tactics will realize that what they say is true. No matter how we improve the security of our computers, more attacks are sure to come, and they may not be so sophisticated.

Only by turning to systems that really do benefit people can we disarm the new Luddites.

Letters to the Editor

Employment By Handwriting

Analysis Judged Unfair

This letter is a comment on an article which appeared in your Nov. 11 issue regarding a certain Charles Martin, the handwriting seer.

I was particularly disturbed by the comment that a person's success or failure in business might depend on his pseudo-scientific "analysis" of his handwriting — a "science" so perfected that it can be turned over to a computer! On the other hand, the ludicrous suggestion that his work is a parallel to a trained psychologist's analysis had me in stitches.

A respected psychologist, Kurt Lewin, warned, many years ago, about the very basis of Mr. Martin's work when he cautioned about looking at things phenotypically. To cite the classic example — youngsters who were punished either very much or very little at home displayed the same amount of aggressive behavior in the classroom. However, the amount of phantasy aggression in a child was directly proportional to the amount of punishment they received at home. Thus, although phenotypically the two groups were identical, genotypically they were very different. Yet, without any other knowledge as to the person's

background, Mr. Martin is audacious enough to describe his entire psychic make-up by the way he dots an "i".

I suggest that this is equivalent to lumping all mankind together in a group labelled "blood-bearing" — for the purpose of transfusion! On the more practical side, I would suggest that this is an unfair employment practice — irrespective of its inanity and, as such, would be a basis for bringing charges against the company employing such devices.

Donald A. Sordillo

Cambridge, Mass.

Attention Must Be Given To Computer Errors

You may consider people's customs as childish when they punch extra holes, etc., as you noted in your 8 October editorial. You may change your mind, however, when you recall the story of the soft-spoken male skinner who bopped the mule with a two-by-four. You do have to get their attention.

Richard B. Mathews

Senior Research Engineer

Southwest Research Institute
San Antonio, Texas



It doesn't hurt a Bit.

bit

Miniature CRT Displays 'All' Characters

WHIPPANY, N.J. — A display device that is said to be capable of displaying a virtually unlimited number of different characters (including such diverse symbols as those used in foreign alphabets) on small high-resolution CRTs has been announced by Madatron Corp. of this city.

The system, which can be readily interfaced with most computers (through some extra software in the processor), is aimed at a number of applications. Uses which normally require look-up operations to determine symbolic answers can now be accessed and displayed via the CRT device. Examples include wiring instructions and commands for an operator of a machine tool. Operating system message display might be an-



Madatron Display

other use, and also mathematical formulae, the firm says.

The unit has not as yet been interfaced, by the manufacturer, to a computer system, however. Basically, the unit consists of a

drum containing the desired characters (another drum can be programmed with words), a character generator, and a display unit. The latter is said to have a virtually unlimited num-

ber of display positions and possible characters.

The display is operated by a 6-bit entry code, with the computer itself storing the desired characters including those not provided by the manufacturer of the processor. The total character limit appears to be the possible number of different 6-bit combinations that can be stored.

The character display is said to cost \$35 to \$75 per CRT position, depending on the number of display positions, packaging requirements, and the number of systems included in the order. Delivery is currently quoted at 60 days, but the company is looking forward to shortening this time early next year.

Madatron, Inc., is located at 110 Route 10 here.

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And we don't build our optical mark readers just to handle payrolls in plush offices. They're rugged enough to work in machine shops, warehouses, even on construction sites. In fact, you can put them just about anywhere you need important information fast. Information on material movement, order entry, quality assurance, inventory control.

New design techniques are the key to our readers' reliability. For example, we've developed a special feed system that virtually eliminates card jamming and mutilation. And a unique mark detection

feature assures accurate reading of even poorly marked cards.

All our optical mark readers cost less than \$1000. That's another reason they make it so easy for you to save. Your local HP computer specialist can show you just how easy. Call him. Or write to Hewlett-Packard, Palo Alto, Calif. 94301; Europe: 1217 Meyrin-Geneva, Switzerland.

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New Products

Data Set Handles 70 Terminals

WESTWOOD, N.J. — A time division multiplexer-concentrator is said to be able to multiplex or concentrate up to 70 asynchronous, full duplex, low-speed terminals to form one high-speed voice band line for public or private transmission, according to Timeplex Inc.

The unit, labeled M/C-70, includes multiplexer, concentrator, demultiplexer, and de-concentrator, and can send and receive simultaneously, the manufacturer says.

It is said to process three or more code/speed terminal groups, and to concentrate any sets of input terminals before multiplexing them.

The major benefit of concentration is that relatively inactive



M/C-70 Multiplexer-Concentrator

terminals are kept from monopolizing multiplex channels. The company says that several units at different locations can be connected through voice-band lines to enhance configuration versatility and cost effectiveness.

Standard features include automatic failure disconnect and spare unit fallback, continuous hardware error testing, and programmable parity bit checking or insertion.

Options are in the areas of automatic code/speed adaptation and automatic low-speed dialing and answering.

The M/C-70 is modular, selling in groups of eight lines. The smallest (eight-line) unit sells for \$5,800, going up to 70 lines for \$9,800, the company says.

Delivery is currently stated to be 60 to 90 days. Timeplex, Inc. is located at 15 Charles St.

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New Cassette Designed for Tape Drives

REDWOOD CITY, Calif. — A tape cassette designed specifically for use with cassette tape drives used in key-to-tape converters and remote terminals has been developed by Ampex Corp.

Designated the PC-800, the cassette is said to provide the greatest reliability and best tape skew and pack characteristics now available. Most cassettes now used with computers were designed for less demanding audio applications, the company claims.

J.L. Porter, Ampex vice-president, said the PC-800 employs a precision plate; steel bearing mounted fixed hubs, and a four-point tape path system.

The cassette uses Ampex series 870 Cat computer tape and each unit contains up to 300 ft of full-width tested tape, compatible with any track or machine requirements, according to the company.

The cassette will be available in January for immediate delivery. The price is expected to be below \$10, a company spokesman said.

Ampex Corp. is located at 401 Broadway here.

Adding Machines Detect OCR Print

CHICAGO — Three optical font adding machines with printing that can be scanned by OCR readers for computer input are being offered by Victor Comptometer Corp.

Accounting data from the units can be read in milliseconds by OCR readers that can operate on-line to computers or produce magnetic tape for later input, according to the company.

Applications for the units include chain store order control, accounts receivable and payable, inventory control, cash disbursements, and analyses for sales, job cost and expenses.

Two of the machines, one a simplex (one total), the other a duplex (two total), have wide carriages for tape or page printing. The third, a simplex, uses standard adding machine tape. The machines list and total 12 digits in each column.

The left column of a duplex unit can be used for code groups, account or item numbers, and the right column for dollars and cents. Totals on each column can be checked against the automatic computer totals to assure the programmer that all lines were read and entered correctly, the firm says.

The simplex model F1-12L with standard tape is priced at \$349; the simplex wide carriage, F1-12SL, \$570, and duplex wide carriage, F1-12SDL, \$670.

Victor Comptometer Corp., Business Machines Group, is located at 3900 N. Rockwell Street.

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COMPARISON

Computing the average of a set of numbers:

FORTRAN	BASIC	APL PLUS
DIMENSION X(1000)	DIM X(1000)	(+ /X) ÷ pX - □
READ (2,61, (X(I))=1,N)	READ N	FOR I=1 TO N
6 FORMAT (I5, (E15.2))	FOR I=1 TO N	READ X(I)
S=0.0	S=0.0	S=S+X(I)
DO 4 J=1,N	NEXT I	
4 S=S+X(J)	AVG=S/N	
AVG=S/N	PRINT AVG	
WRITE (3,5) AVG	DATA	
5 FORMAT (E15.2)	END	
END		

Characters required:
FORTRAN-722

BASIC-75

APL PLUS-10

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That's not all that surprising considering there are about 40,000 unit record installations in this country, with an estimated 600,000 pieces of punched card machines now in use.



With numbers like those you need a lot of well trained professionals in a lot of places. Which is why we can provide 24-hour service in more than 50 locations.

It would be nice to be in a business that wasn't always vanishing. But you get used to it. They first closed the book on the unit record business 15 years ago when IBM brought out the 650. Then came the 705. Now it's the System/3 and we are once again the Ghost of Data Processing Past.

Yet everywhere you look you see those familiar old tabs and sorters and calculators,

humming away, getting the work out. Unglamorous, uncomplicated, and inexpensive. So inexpensive, that it's possible, for the price of one hour's computer time, to rent a small unit record combination for a whole month.

A lot of people know this, and a lot of people take advantage of it to get more out of their computers,

and at great savings. Bog a computer down with a lot of raw data and you're likely to bog down your profit and loss statement as well.

Then there are things like computer editing and back-up. Not exactly the stuff of tomorrow's headlines, but not to be ignored either. Especially when the auditors are hanging around.

In the salons of technology they twitter about the new computers, and sometimes we do, too. But all those workaday calculating tasks keep piling up, problems in search of an economical solution. That's why all those punched card machines are still around. Along with all those well trained men to care for them. You need good men in a vanishing business.



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British Computers Linked

Special to Computerworld
MANCHESTER, England—An experimental microwave link between two computers has been established by Imperial Chemical Industries, one of the largest computer users in the UK. The link has been used to transmit data between a main computer in Manchester and an IBM 1130 terminal system, 12 miles away in Wimslow, Cheshire.

The experiment is an attempt by ICI to establish a system offering greater reliability at less

cost than the telephone links currently available from the General Post Office (the national utility which handles all postal and telecommunications facilities). These links, the only commercially available means of achieving computer/terminal communication, are both relatively slow, and susceptible to loss through noise or line failure.

If successful, the experiment could have considerable importance to UK computer users

UCC Digital Data Network Would Tie Subscribers to Local Phone Facilities

By Ronald A. Frank

FALLS CHURCH, Va.—A proposal for a common carrier communications network serving 35 major metropolitan areas has been filed with the Federal Communications Commission by Data Transmission Co. (Datran), a wholly-owned subsidiary of University Computing Co. The network would handle digital transmissions for computer users.

Although the projected microwave network had been previously announced [CW, Nov. 12], the filing before the FCC provided additional details concerning the operation of the proposed system.

The network would consist of 244 microwave repeater stations, 10 district offices for computerized switching, and "tail" circuits to customer locations. These customer links would include cable-type interconnections.

According to Datran, planned rates for network use would be figured in seconds of use rather than minutes; and it was claimed this method would cut average user costs in half compared to present common carrier facilities.

The Datran net will handle digital transmissions at rates up to 14,400 bit/sec on a switched common carrier basis, the company said, or up to 30,000 bit/sec on a private line facility.

However, in detailing plans for local interconnection loops to subscriber premises, Datran said, "the subscriber's data transfer rate will be limited by the class of service provided by the interconnecting common carrier."

Basic network usage rates would be scaled to transmission speeds as follows:

Bit/Sec	Cost/Mo
150	\$20
4,800	\$25
9,600	\$30
14,400	\$40

Usage charges for "data units" scaled to transmission rates, monthly charges for equipment, and installation fees would be added to the basic costs, according to the FCC filing.

Datran reportedly has contacted common carriers around the country including independent telephone companies proposing interconnection arrangements for local loops to subscriber premises.

The initial network would exclude service in large geographic areas such as New England, the Southeast, and Mountain and Pacific regions.



DATRAN NATIONAL NETWORK

Datran data transmission network would serve 35 cities.

the computer industry's first key-to-disc data input system accepts the output from 60 or more key stations simultaneously

Time-shared input cuts data preparation costs 50%.

Now you can cut your computer input costs in half. This new innovation in data preparation techniques gives you two money-saving advantages over conventional keypunch or one-key-board-one-magnetic-tape-per-operator systems: (1) the LC-720 employs a computer time-shared input; (2) it is the only system available that provides data output directly on IBM/360-compatible magnetic disc.

By time-sharing the data from 60 or more keyboard operators simultaneously, significant savings in data station costs of as much as 50% can be achieved. Costs drop to as low as \$4300 per data station for a typical 60 station system. For large data preparation installations, the time-shared input is the only economical way to go.

Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the mounting, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1316 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM/360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable by each operator from 1 to 120 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

LC-720 KeyDisc System

Bring your own data for a demonstration

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and Logic will provide a reel of magnetic tape of the output of your data from this LC-720 for later printout at your own computer facility.

To arrange for a demonstration, contact Gary Tischler, Director of Marketing (201) 334-3713

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Reach System Provides Instant Access to Hospital Information

BEAUMONT, Texas - A new system designed specifically for use in hospitals uses high speed computers and electronic mass storage equipment to create a communications network throughout the hospital.

The system, called Realtime electronic access communications for hospitals (Reach), has been developed by National Data Communications, Inc. (NDC).

The initial system was installed in the Baptist Hospital of South East Texas in Beaumont. This system is currently in the final stages of operational testing, according to Thomas W. Rutledge, chairman and chief executive officer of NDC.

Central, Remote Computers

The Reach system is built around a number of CRT display station consoles and teleprinters that are located at numerous strategic points within the hospital. All important data in the system is made through the consoles.

Remote site computers control the system in the hospital. All vital patient data along with inventories and catalogues are stored and processed here. In addition, central site computers store and process general ledger, payroll, accounts receivable, and accounts payable.

Finally, a microfilm center produces the patient records. Four inch by six inch films are produced directly from magnetic computer tapes.

Fully Utilizes Facilities

The Reach system is designed for the total hospital operation from admission to discharge of patient. It also has complete data processing capabilities as an accessory to the real-time system. With its ability to schedule services, facilities, equipment and personnel, it offers the administration opportunity for full utilization of the entire hospital.

The system is planned around the patient ordering process. Information on a patient admitted to the hospital is entered directly into the system through a console operated by admitting personnel who are skilled typists.

From this point on, doctors' orders for diagnosis, treatment, or medication are implemented instantly. At the touch of a button, a nurse can schedule her patients for x-rays, clinical lab tests, physical therapy, or any other service the hospital offers right from her nursing station, and without lifting a pen.

Total Communications

Because it is a real-time system, Reach offers doctors, nurses and other medical personnel total communications throughout the hospital.

A doctor, for example, is no longer required to go to a specific nursing station to view a patient chart or place an order. He can do both from any display station console in the hospital.

A nurse can place an order for any service in a matter of seconds. From the console, she

selects the patient, the doctor who will sign the order, the medication, and the dosage. The medication is automatically checked against sensitivities.

Orders on Printout

With the touch of the final select button, Reach will automatically and instantaneously alert other departments throughout the hospital.

Applications

The pharmacy receives the order on a special teleprinter that is loaded with gummy labels. The pharmacist fills the order from the printout. The order is also printed at the patient's nursing station. If the nurse places an order for a clinical lab test, the laboratory would be notified on its teleprinter of the type of test desired and the time and place for the test to be made. The order also would be printed at the patient's nursing station.

At the time the order is placed, the patient is charged for the test, treatment or medication. The patient's bill is always current.

Records Protected

The Reach system is entered by inserting a specially coded badge into the console. In this way the integrity of patient records is protected. The badge is coded to the specific individual and he receives only that information that the badge entitles him to see. A doctor, for example, sees an alphabetical list of only his patients in the hospital when he inserts his badge.

Records Stored on Fiche

Reach creates a permanent easily retrievable medical record of each patient as an integral part of the system. A discharged patient's medical record is sent to the central site computers where it is stored on tape until it is completed by the physician.

The tape is then sent to the micro dimension center. Here the records are microfilmated at computer speeds by a Universal Camera capable of real-time 15,000 char/sec directly from

computer tape.

The film is processed and placed on microfilm. The 4 in. by 6 in. fiche, each containing up to 224 pages of records, are then sent to the hospital for permanent storage in medical records.

Some 18,000 pages of medical records can easily be carried in one hand and any one of these records can be retrieved in minutes in the hospital.

Contracts

NDC has signed contracts with Honeywell totaling \$36.8 million for computers and other electronic equipment, and for \$19.5 with Raytheon for the specially designed terminal units, according to the company.

The CRT display station terminals are the sole instruments used by hospital personnel in the operation of the Reach system.

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Antarctic Scientific Research Aided By Computer On Board U.S. Naval Ship

NORWOOD, N.J. — A seagoing computer is helping scientists seek answers to questions about a little-known region, the Antarctic.

The computer is aboard the U.S. Naval ship *Eltanin*, now at sea on a 70-day, 6,000-mile cruise devoted to scientific research.

In probing the Antarctic scientists will use an IBM 1130 to help answer questions dealing with the formation of the earth, the effects of cold ocean currents on world weather, and the potential for commercial fishing in southern oceans.

Full-Time Research Vessel
The *Eltanin's* research is sponsored

by the National Science Foundation's office of Antarctic programs. The ship is manned by a civilian crew and carries a complement of 38 scientists.

Technical support for the ship's scientific equipment, including operation of the computer, is provided by Alpine Geophysical Associates of Norwood.

Nautical Data

As the ship is sailing, data is constantly input describing the earth's magnetic field, the depth of the ocean bottom, the configuration of the seafloor layers, sea-surface temperature, and gravity values.

The ship is periodically stop-

ped to gather acoustic information about bottom cores, water column velocity, salinity, and temperature and bottom photographs.

This data is all stored aboard the ship; some on magnetic tape, but most in the form of analog records. A few physical samples are also stored.

Data Processed on Ship

"Onboard processing of this data by the computer will enable us to refine the experiments while they are in process," said Walter Smolen, port administrator for Alpine.

"Processing the data by hand, or transmitting it to shore based computers for processing is no longer necessary."

All records are reduced to computer inputs, either by means of magnetic tape direct input, analog-digital table converter, or in the case of bottom samples, by a laboratory measurement and key-punched parameters.

The IBM 1130 then reduces all the data and relates it to a geodesic position from known time.

Results of Experiments

Final output results vary with the type of input. The magnetic field readings are reduced to anomalous values above or below the computed main magnetic field of the earth by geodesic position.

This results in a listing of anomaly by position or a plotted chart with values.

A continuous profile of the ocean bottom is produced relative to position, along with a chart of depth values. A similar output, without the chart, is produced for the seafloor layers.

Sea-surface temperature values are related to position and gravity values and reduced similarly to magnetic values.

Vertical profiles of the ocean and its immediate bottom are also charted.

Fishing Potential

Specimens of marine life studied by the researchers may help determine the Antarctic's potential as a fishing ground. To date, with the exception of whalers, the area has been largely ignored by fishermen because of its remoteness.

The *Eltanin*, has dredged up from the distant past the fossil remains of animals known to be of African origin. While these animals were amphibious, there were not swimmers. This suggests that the two continents were once joined.

The computer will also help to speed the processing of data from navigational satellites.

Exact positioning of the ship is important for scientific research.

In the Antarctic region, conventional navigation is difficult because of long periods of cloudiness.

All the information is finally assembled in reports, producing a total picture of the ocean examined during that cruise.

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The extreme efficiency of TOTALTRAN's proprietary software packages permits CPU to publish its fixed fee schedules regardless of the complexity of the programs to be processed. With our published prices the client is able to perform his own cost analysis and not be subjected to the cost variables of other translation and disassembler services

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- Option II — to include label equates from an original assembly listing
- Option III — guarantees operational source deck

*CPU Management Advisory Corp. is a wholly owned subsidiary of Commercial Programming Unlimited Inc., a publicly owned company

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RCA

Adapso Elects Officers, Board; Roy New President

NEW YORK—The Association of Data Processing Service Organizations (Adapso) has announced its officers and board of directors for 1969-70, elected recently at the group's eighth annual meeting.

Officers are: President, John L. Roy, president of Randolph Data Services, Inc., Cincinnati; Vice-President, Bernard Goldstein, president of United Data Centers, Inc., New York; and Treasurer, T.J. O'Rourke, president, Tymshare, Inc., Palo Alto, Calif.

The board includes, in addition to the three officers, J. Van Horn, president, CTSS and VIP Systems, Inc., Washington, D.C.; K.R. Johnson, president, Data Management, Inc., Minneapolis;

H.W. Robinson, vice-president, Control Data Corp., Washington, D.C.; K. Young, president, Data Link Division, University Computing Co., Dallas; R.D. Caldwell, president, Data Systems, Inc., Minneapolis; M. Pfeffer, executive vice-president, Statistics for Management Data Processing Co., New York; A. Steinhart, chairman of the board, Datastat, Inc., New York; E.T. Suters, president, Management Services, Inc., Atlanta; F.R. Lautenberg, executive vice-president, ADP, Clifton, N.J.; and L.J. Palmer, president, CompuTerminal Corp., San Francisco.

The 235-company society reported a 40% membership gain and a \$20,000 treasury surplus for 1968-69.



COMPUTERWORLD

societies

Process Control Languages Featured on IEEE Cassette

NEW YORK—Cassette Colloquium, a project designed to make current information in technology available to a wide audience through the use of compressed speech tape recordings has been inaugurated by the educational activities board of the Institute of Electrical and Electronics Engineers (IEEE).

The program is designed to supplement, rather than supplant, techniques currently used

for communicating with the society's large membership. Its principal feature is tape recordings in cassette form of special workshops and seminars for which other material is unlikely to be readily available.

The first available recording covers a recent workshop discussion on the current status of languages for process control, entitled "Industrial Programming Languages" or IPL-69.

According to J.M. Kinn, IEEE director of educational services, the electronic speech compression technique used accelerates the delivery of the speaker without distorting the pitch of his voice. Used in conjunction with careful copy and tape editing, he said, this approach has permitted concentrating a 2-1/2 hour presentation into about 75 minutes.

The institute anticipates producing a continuing series of the cassette recordings and is currently working on a second presentation dealing with mini-computers.

In addition, they plan to offer a coordinated package of taped commentary and visual material. Current plans include offerings selected from the IEEE 1970 international convention and exhibition. Subjects from the technical will be recorded during the convention and offered soon after in conjunction with a complete set of the authors' visual material.

Kinn said that eventually the society hopes to be preparing one program a month for distribution.

The cassettes, he said, are compatible with the machines of almost any manufacturer and lend themselves to easy use at home or in an automobile.

Copies of the IPL-69 package are available for \$6.00 to members and \$10.00 to nonmembers from IEEE headquarters at 345 E. 47th St., New York, N.Y. 10017.

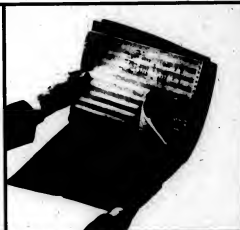
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Medical Manikin Modified To Expand Capabilities

AZUSA, Calif. — Sim One, the computer-controlled patient simulator at the University of Southern California School of Medicine (CV, Sept. 4, 1968), is undergoing major modifications to expand its capabilities as a medical teaching tool.

Conceived by USC medical education researchers and designed by the electronics division of Aerojet-General Corp. in 1967, the medical manikin duplicates many symptoms and physiological responses of human patients. It was first used to teach resident physicians difficult anesthesia skills.

Development of further applications for the "imaginary invalid" were soon plagued by a shortage of funds. Now, a \$365,195 research grant to the USC medical school from the U.S. Public Health Service has made more sophisticated modifications possible.

Under the follow-on program, the simulator will be fitted with a new right arm and a special-purpose, portable computer to extend its applications to training nurses, interns, medical students, and hospital ward attendants.

Sim One originally used a hybrid system which will now be replaced by a Honeywell 316.

The modified arm will have identifiable "muscle," "nerves," "bone," and "pulse," with internal instrumentation to identify and measure the quantity of three different simulated drug injections. Modification will also be made in the computer program to cause the simulator to respond with the proper pharmacological and physiological reactions to these drugs.

Stethoscopes and blood-pressure cuffs will be used on the flexible new arm, and it will be possible to withdraw "blood" samples by venous puncture. During an injection, Aerojet-General says that instrumentation in the arm will detect and report contact with bone and nerve areas and the arm will jerk to signify discomfort.

All previous capabilities of the simulator will be retained. The alterations are expected to be complete by summer. Then the modified manikin will be moved to the Los Angeles County-USC medical center for a two-year program of research, development, and training

studies to determine the feasibility and cost efficiency of training the new groups of health-care personnel in a wide variety of tasks.

The modification work is being conducted by Aerojet's computing sciences department. Program manager is A. Paul Clark; Leonard Taback is project manager.

Principal investigator for the three-year program will be Dr. Stephen Abrahamson, USC professor of education and head of the division of research in medical education. Dr. J.S. Denson, co-director with Abrahamson of the initial Sim One project, will serve as a consultant on the new program.



COMPUTERWORLD

education

GE Releases Introductory Computer Film for High School, College Use

SCHENECTADY, N.Y. — A new title, "You and the Computer," has been added to GE's catalog of educational films.

The 16mm sound and color film is designed to acquaint the viewer with a computer's function and to arouse interest in computer-related study.

Using the issuance of a paycheck as a framework, it compares the speed and efficiency of a computer with the laborious

task of a similar manual operation.

Directed at students in secondary schools, colleges, secretarial and business schools, data processing schools, and industrial training programs, the film runs for nine minutes, combining live action and animation.

Further information is available from General Electric Educational Films, 60 Washington Ave., Schenectady, N.Y. 12305.

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MEMO

to: A.S.
from: J.S.
subject: Communications System Reconsideration
date: October 1, 1969

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PROPOSED LAYOUT

CURRENT MONTHLY WIREAGE COSTS FOR A STABLE 3000' ON LINE (Interstate):

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100 miles	\$50	\$50	\$50	1,500 miles
\$100	\$500	\$500	\$412	\$1,100

TOTAL MONTHLY WIREAGE COSTS FOR CURRENT SYSTEM: \$1100 x 4 lines = \$4400

TOTAL MONTHLY WIREAGE COSTS FOR PROPOSED SYSTEM: \$1100

SAVINGS PER MONTH WITH PROPOSED SYSTEM: \$4400 - \$1100 = \$3300

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New Books

Real-time Data-processing Systems: A Methodology for Design and Cost/Performance Analysis, by Saul Stinner, McGraw-Hill Book Co., 256 pages, \$13.50.

This book is designed for data processing practitioners who are interested in calculating and optimizing the performance per dollar of real-time systems, typified by message-switching and automated airline-reservation systems. The author develops a broadly applicable methodology that helps the reader to construct cost and performance relationships for each application. The appendices include definitions of technical terms, a glossary of symbols used, discussion of queuing theory, a brief intro-

duction to probability and the use of probability tables, and derivation of equations.

Applied Linear Programming, by Norman J. Driebeek, Addison-Wesley Publishing Co., Inc., 230 pages, \$11.50.

This book describes how mathematical programming techniques and especially linear programming can be applied to operational problems. Since the original development of linear programming, its practical uses have grown at an unprecedented rate. While linear programming applications have been diverse, common denominators have been the development of mathematical models of operations and the use of standard general-purpose solution routines. The

volume emphasizes the development of linear programming models and the application of these models to industrial problems.

Principles of Automated Information Retrieval, by William F. Williams, The Business Press, 475 pages, \$15.

This book discusses the techniques and background needed for proper implementation of an information retrieval system.

It encompasses a fundamental training course for information retrieval specialists, as well as illustrating techniques and equipment available to the facility design of an information retrieval system. The book describes implementation of small-

and large-scale systems and includes advanced treatment of information measurement systems, retrieval programs, and data bases. It contains over 225 illustrations, graphs, flow charts, mathematical tables and graphs, and pictures of EDP equipment.

Management and the Computer in Information and Control Systems, by Barton Hodge and Robert N. Hodgson, McGraw-Hill Book Co., 282 pages, \$13.50.

This book is designed to bridge the gap between the manager and the computer expert in problem definition and communication, as well as to provide a basic framework that the manager can use to define and analyze his systems requirement. It

consolidates several proven concepts and introduces various new ones, which are put together to form a meaningful package of state-of-the-art methods that will help the operations manager make maximum use of the computer.

Fundamentals are described and shown in their application to the management environment. Case studies are used to depict the application of these tools and techniques for showing the manager how to begin applying them to his own area of concern so that he may state his requirements to the computer expert in meaningful terms.

Condensed Computer Encyclopedia, by Philip B. Jordin, McGraw-Hill Book Co., 580 pages, \$14.50.

This encyclopedia, alphabetically arranged and cross-referenced, is designed to meet the needs of the businessman who has to (or wants to) deal with computers, the student who needs to use a computer, and the junior programmer about to embark on his career. Basic entries, such as "computer," are described in layman's terms, while more complex entries, such as "overlay," make fuller use of basic computer terminology.

Entries are developed from an easy-to-grasp basic definition to more advanced concepts. They are illustrated by means of an application or a worked-out example, whenever feasible. The encyclopedia covers as many words as may normally be encountered in a computer center and features descriptions of programming languages from Algol to Telcomp.

How to Use the Computer in Business Planning, by Dr. Henry F. Lande, Prentice-Hall, Inc., \$19.95.

This book, developed for use within IBM, shows how to develop credible and precise plans that represent achievable goals, plans that foster coordinated decision-making in a decentralized management hierarchy.

It describes a divisional model within a corporate planning system and includes the functional models within a divisional planning system. It explains how the corporate system would function to help evaluate the effects of revised forecasts.

It gives staff planners and managers all the material necessary for a complete systems development effort, as well as the pitfalls to avoid. This handbook is heavily illustrated with reproductions of planning statistics and worksheets as prepared by such a computerized system.

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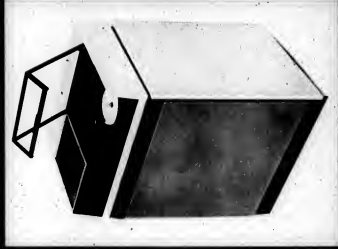
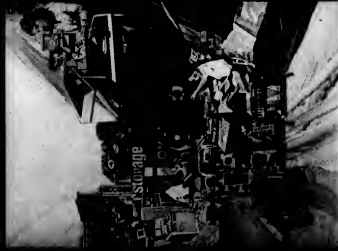
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At left, the creative past points to an inspired future. At right, the creative past points to an inspired future.

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Speed has always been the underlying goal in the history of computers, beginning with the use of the ancient abacus thousands of years ago. Speed prompted a teenage genius, Blaise Pascal to develop the first calculator as early as the 17th Century. Speed was the objective when the first electronic computer was developed in 1947, and is still the goal today.

Very simply, each new development has spawned more developments, erasing, contemporary stan-

dards, setting even higher goals, allowing even greater advances.

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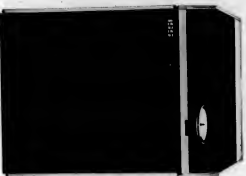
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Specifications

701 DISK STORAGE DRIVE

Access Time	
Track-to-track	10 ms
Average	30 ms
Maximum	60 ms
Start-Up Time	13 sec
Storage Capacity	7.25 million bytes
Disk Speed	2400 rpm
Number of Heads	10
Number of Disk Surfaces	10
Data Transfer Rate	156,000 bytes/sec
Operating Environment	60 to 90 °F. 8% to 80% RH



Specifications

714 DISK STORAGE DRIVE

Access Time	
Track-to-track	10 ms
Average	32 ms
Maximum	60 ms
Start-Up Time	20 sec
Storage Capacity	29 million bytes
Disk Speed	2400 rpm
Number of Heads	20
Number of Disk Surfaces	20
Data Transfer Rate	312,000 bytes/sec
Operating Environment	60 to 90 °F. 8% to 80% RH



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ISS
Information
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December 3, 1969

Page 25

1st Product, 1st Month: \$2 Million

ASHLAND, Mass. — Nortec Inc.'s first product, a mini-line printer priced at "under \$6,000 at moderate OEM levels" racked up sales of over \$2 million in its first month on the market, according to the company's president, Seldan Lazarow.

The Nortec 200 operates at 200 lines per minute, and the company says that it fills the gap between expensive high-speed units and teletypewriters.

The company also announced that it has a letter of intent for a privately-placed \$1.5 million (financing from Munger, Bant & Currie, a New York investment firm). The additional capitalization will be used "to assure Nortec's ability to provide an expedient and efficient manufacturing capability."

Nortec is presently headquartered at Ashland, and is currently negotiating for a substantially larger facility in the same area for occupancy in early 1970.

Com-Share to be Acquired By Computer Complex, Inc.

HOUSTON, Texas — Computer Complex, Inc. and Com-Share, Inc. have agreed in principle for the issuance of 1.5 shares of Computer Complex, Inc. common stock in exchange for each share of Com-Share, Inc. common stock.

The proposed combination of companies is subject to the signing of a definitive initial agreement of merger by both boards specifying the above terms and several conditions deemed to be in the best interest of the surviving company.

Under terms of the agreement, the timesharing operations of Computer Complex will be merged into Com-Share which will operate as a wholly-owned subsidiary of Computer Complex, Inc.

Robert F. Guise Jr., president of Com-Share, Inc. and vice chairman of the board of Computer Complex and Robert A. Westerhouse, president of Computer Complex, will be president and chief executive officer of the surviving company.

Richard L. Crandall will be president of the timesharing company and executive vice president in charge of operations of Computer Complex. C.H. McCall will be executive vice president and financial officer of Computer Complex.

Aries Corp. Anticipates Recovery From Bad Times

FAIRFIELD, N.J. — Aries Data Centers, Inc. reporting "on behalf of its corporate office," says that Aries Corp. has recovered from a period of substantial losses.

Aries Corp., headquartered in McLean, Va., reported profits of \$737,311 (3 cents per share) on sales of \$1,329,536 for the first quarter of its fiscal year ended Sept. 30.

The company also said it had a backlog of work amounting to more than \$2 million and "the highest level of working capital," more than \$1.4 million, in the firm's history.

Earlier, for the six months ended June 30, the company reported it had achieved a net profit of

Computer Complex has 1.3 million common shares and 200,000 convertible preferred shares outstanding.

Com-Share has 740,000 common shares outstanding and, on a fully diluted basis including convertible debentures, options, and warrants, would have 1.2 million shares outstanding.

Com-Share, Inc., headquartered in Ann Arbor, Mich., has computer centers in Ann Arbor, Los Angeles, and in Norwood, N.J., and provides timesharing service in 34 cities in the U.S. and Canada.

Computer Complex, with headquarters and computer center in Houston, provides timesharing service in 34 cities. The combined companies will provide increased national timesharing coverage because the companies do not operate in the same areas to any substantial extent at this time.

In addition, Computer Complex is involved through its subsidiaries — in the design and manufacture of computer communications equipment (Communications Logic, Inc.); in the leasing of computer communications equipment (Computer Equities, Inc.); and in supplying specialized computer services to the oil and gas industries (The Analysts, Inc.).

\$3,818 on sales of \$2,837,124 compared to a loss of \$101,230 on sales of \$2,297,823 for the same period of 1968.

The first three months of 1969 showed a loss of \$84,970.

Last May the company became a subsidiary of Automation Technology, Inc., when Aries purchased Autotech Systems Corp., a wholly-owned subsidiary of ATI. The stock transaction gave ATI more than 50% control of Aries.

Aries, from its corporate office in McLean, supports operating divisions located in the metropolitan areas of New York, Philadelphia, Chicago, Washington D.C., Minneapolis, Los Angeles, and San Francisco.

Mohawk Data Sciences Expects Record Revenues in 1st Quarter

HERKIMER, N.Y. — Mohawk Data Sciences Corp. preliminary figures indicate that first quarter revenues will reach about \$24 million, including \$7.9 million from rentals and service.

V.E. Johnson, chairman and chief executive officer, told shareholders at the company's annual meeting that "this should result in after-tax profits of at least 35 cents per share, including a gain of about 5 cents per share from the revaluation of foreign currencies."

Johnson noted that all divisions and subsidiaries, both domestic and foreign, contributed to the expected gains. "Actual figures for the quarter will be released after the final consolidation, which should be soon," he said.

In the comparable quarter a year ago, MDS reported total

revenues of \$11,660,000, of which \$4.1 million came from rentals and service. Earnings in the year-to-date quarter totaled 21 cents per share, including a benefit of 3 cents per share from the utilization of tax carry-forward losses.

Lease-to-Sale Rates

"Because of the high cost and limited availability of money," Johnson stated, "the company's lease-to-sale ratio has continued the trend exhibited in the fourth quarter of fiscal 1969."

"To stabilize this ratio at more normal levels and thereby cushion the impact of such externally-generated fluctuations on earnings growth," he said, "management has initiated a program by which a portion of rental equipment may be sold periodically to a third party con-

cern as deemed advisable in the light of prevailing monetary conditions."

During the first quarter, about \$1 million in sales were realized from this source.

Johnson also said that notification had been received from the U.S. Patent Office that a patent will be issued in the near future covering the basic key-entry functions performed by its Data-Recorder line of keyboard-to-magnetic tape data entry machines.

The company intends shortly to file a registration statement covering the sale of about \$25 million of convertible debentures "to finance the growth of our rental program and repay high-cost bank debt," he said. Further, he told shareholders that MDS is planning to file for a listing of its common shares on the New York Stock Exchange.

Scientific Resources Plans to Double Revenues From Computer Oriented Units

NEW YORK — Scientific Resource Corp. plans to double its revenues from the computer industry in 1970 to \$20-\$25 million, up from about \$12 million in 1969. Computer-related financial revenues expected in 1969, according to Thomas T. Fleming, president, include revenues from the Land Resources Corp. subsidiary are expected to increase to \$40-\$45 million, up from about \$30 million in the prior year, he told the New York Society of Security Analysts recently.

Fleming also announced the company is completing arrangements for investment in a new European company. The agreement, he said, has been signed and provides the basis for a systems and software operation in various overseas countries.

Scientific Resources will own 25% and the balance will be held by prominent European groups. Scientific Resources, Fleming said, will have a technical agreement whereby the company will develop software that is to be marketed, together with other software, by the new venture. Initial capitalization will exceed \$3 million.

In tracing the growth of Scientific Resources over the past 18 months, Fleming pointed out that the company's technical staff has grown from 100 to over 600 people, and the company had successfully made the transition from what was, in effect, a holding company to an operating company as well as accomplishing an extensive financial restructuring program — all in 12 months.

Scientific Resources Corp. was formed about a year ago when a computer company and a small software company formed the present company.

In the past 18 months, Fleming said, "We raised over \$56 million of new money, used stock for the purchase of about \$4 million worth of assets, and arranged additional financing for about \$9 million."

"Concurrently," he said, "we paid down about \$29 million in debt and our net worth increased from about \$30 million to about \$50 million and we are presently negotiating to convert our remaining financial operating companies — Atlas Financial and West Jersey Title and

Guaranty Company — into 'investments.'"

This has been accomplished while simultaneously acquiring computer and computer-related fields for stock.

The next two years, said Fleming, call for the full application of expanding and maintaining a high-technology, people-oriented company, "securely based in tangible assets and capable of filling the huge gap that exists between computer hardware technology and the user's ability to apply it."

Computer Technology Sale To UCC Appears Imminent

By a CW Staff Writer

DALLAS — The on-again, off-again sale of Computer Technology, Inc. appears to be coming to a final decision. After negotiations with Prudential Insurance were terminated, University Computing Co. has apparently come up with a package satisfactory to UCC Chairman Sam Wyly and the seller, LTV Aerospace.

The major point of the agreement is that the seller (and major user of CTI's facilities management services) is guaranteeing a minimum annual profit to CTI after the sale becomes final.

The deal is in two sections. The first involves about half of LTV Aerospace's 71% ownership to be exchanged for UCC's equity in three subsidiaries.

These are Academy of Computer Technology Inc., Alcorn Combustion Co., and Bell Equipment Corp. Also involved in this first phase is the payment to

LTV of about \$20 million in cash.

The second part of the full purchase is said to be a transfer of 825,000 UCC shares to LTV. This would make LTV Aerospace a major holder of UCC stock.

The guaranteed profit would come from a 10-year contract for the continuation of services provided to LTV by CTI. This business, currently valued at about \$40 million per year, could be expanded to include services to those subsidiaries not currently covered.

The full transaction is worth some \$130 million, including the \$20 million cash, the subsidiaries valued at \$25 million, and the 825,000 shares of UCC, valued at nearly \$2.5 million as of the Nov. 28 closing price of 99-7/8.

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MAGNETIC RECORDERS

UTE Establishes New Core Stack Facility

ASBURY PARK, N.J. — United Telecontrol Electronics, Inc. is establishing a wholly owned subsidiary company, UTE Trini-

Expansions

dad Ltd., at Port of Spain, Trinidad, to produce memory core stacks and planes for its own use and for sale to other users.

The additional facility, according to a company spokesman, was made necessary by the company's expanding volume of memory systems for the computer and peripheral equipment industries.

He also said that although the company's main manufacturing plant in Asbury Park, N.J., is able to handle the current business volume, projected demand in the future will require additional core stack capacity.

He said the new Trinidad plant, expected to start up in January, will also enable UTE to step up its marketing of core stacks and planes as separate items. The company, along with its line of complete memory systems, has been producing core stacks for internal use for some time.

Along with its memory line, UTE also produces a modern line of computer memory exchangers, and a variety of manual entry memory systems. The company also is a supplier of aircraft radar transponders, beacons, and electronic test equipment.

Com Comp Makes Move To Larger, Modern Plant

HAUPPAUGE, N.Y. — Com Comp, Inc. has moved its research and manufacturing facilities into a newly constructed plant here. The new building is at 1324 Motor Parkway.

The move was made necessary by the rapid growth of the company and the need for additional space required when full-scale production begins in the near future.

The company develops, produces, and markets special-purpose communicating computer systems. The first of its special purpose computer systems, the Com Comp 1, which is a time-shared, on-line, real-time system, has already been tested successfully, according to a company spokesman. He said that the Com Comp 1 is a new concept in computerized information handling for clinical pathology laboratories.

Other Expansions

Keystone Computer Associates, Fort Washington, Pa., a subsidiary of University Computing Co., has announced the formation of a Chicago branch office.

Applied Logic Corp., Princeton, N.J., time-sharing company, has opened three new offices. The western regional office is located at Suite 412, 1625 The Alameda, San Jose, Calif. 95126. The Los Angeles service center is at Suite 209, 4311 Wilshire Blvd. The San Francisco center is in the Arctis Life & Casualty Bldg., Crocker Plaza, 600 Market St.





COMPUTERWORLD

emerging enterprises

Data Bank Specializes in Storage and Retrieval

NEW YORK — Data Bank Corp., headquartered at 369 Lexington Ave., is entering the information (digital, textual, audio; pictorial, and analog) storage and retrieval business utilizing a photo-optical random access mass memory with multi-billion bit or multimillion document capacity.

The corporation will be using its own designed microfilm automatic retrieval and storage system (Mars).

Data Bank Corp. plans to offer the following services: facility management or turnkey operation, including problem analysis, the design of or incorporation of an existing file system, the conversion of the file, and the continuous maintenance of the final system; time-sharing services, including real-time retrieval of records on microfilm through a network of remote viewer consoles with hard copy a by-product; and system consultation, to solve records and management information problems.

Data Communications Company is Formed

WESTWOOD, N. J. — Timeplex, Inc. has been formed to develop, produce, and market data communications products.

Sidney J. Kaplan, president of the newly organized company, stated that the company's primary objective is to "fill the void between the specialized requirements of the computer industry and the available data services of the telephone and telegraph companies."

The company's line of multiplexer-concentrators effects user savings by permitting simultaneous use of many computer terminal devices over a standard voice grade telephone line, he said.

These first product lines feature integrated circuit designs effective in implementing multiplexing techniques.

Other New Companies

★ Maryland National Corp. has announced the formation of Maryland National Optimization Services, Inc., a joint venture with Corporation S. Dallas, Texas.

The company will offer optical reading-input automation services called "Optimization" to companies and governmental agencies in Maryland, Virginia, and the District of Columbia.

★ Applied Cybernetics Corp., Princeton, N.J., specializes in engineering and scientific applications of computers. The new firm will offer consulting and software services to industry and government.

In addition to software, Applied Cybernetics will emphasize the development of new products for information processing.

★ Unicom, Inc., headquartered in Fairfield, N.J., will design,

manufacture, and market components for the computer industry. Plans call for Unicom to introduce a desk-top office data processing system early in 1970.

The company states that it has developed techniques that will make it possible for engineers, schools, small insurance offices and banks, and accountants to afford and operate a data processing system of their own.

LOS ANGELES — Fundamatics, a division of Datal Corp., has opened its doors in four major cities, offering complete, computerized back-office services to the nation's mutual fund industry.

Back-office services refer to all clerical and accounting procedures necessary for keeping track of shareholder records. Fundamatics will process, store, and update all data involving mutual fund transactions.

Fundamatics is involved in back-office procedures such as: transfer agent; dividend disbursing agent; dividend reinvestment agent; redemption agent; shareholder service and accounting; dealer service and accounting; commission accounting; tax data; blue sky analysis; sales, marketing data and statistics;

proxies and bulk mailing services; cumulative discount. Additional Fundamatics' services include: daily portfolio pricing; portfolio analysis; Keogh accounting; microfilming; and profit sharing and retirement plan.

Headquartered in Los Angeles, where its own computer facilities are located, Fundamatics maintains service offices in San Francisco, New York, and Chicago.

Information Displays, Inc. Forms British Subsidiary

MT. KISCO, N.Y. — Information Displays Inc., specializing in man-computer communications, has completed the formation of Information Displays International Ltd., a British corporation, to be owned 80% by Infor-

mation Displays and 20% by Stabelltrons Ltd., a British firm specializing in computer technology.

The new company will make IDI's "Idiom" interactive graphic display systems as well as other IDI products for sale in European markets other than the common market countries. Kenneth L. King, president of IDI, said that IDI is expected to provide IDI with substantial commercial advantages in foreign markets.

The managing director of IDI is Kenneth E. Groves, founder of Stabelltrons Ltd.

Idiom is used for research and in industry for simulation, computer-aided design, data retrieval, market analysis, production control, and management planning.

Amazing Mirac!

Nothing can free your programmers from clerical detail and help them do bigger and better things like Republic's new Cobol program generator.

MIRACL/CPG is a powerful programming system that drastically cuts programming time. Up to thirty Cobol statements are replaced by one MIRACL/CPG statement.

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Which means your programmers will be free to think about systems and program logic instead of punctuation and syntax.

What it does.

MIRACL/CPG helps you generate any Cobol program faster and more easily. Small programs and large. Simple and complex. And you can insert Cobol statements at your option to modify the MIRACL/CPG generated programs.

MIRACL/CPG now makes information systems a reality by simplifying file management and the generation of personalized management reports. An additional feature makes it so easy to write report programs that even non-programmers are using it.

What it can do for your programmers.

Basically, it frees them of clerical details. Quickly. It can reduce programming time to minutes. And machine time to a minimum. For example, complete Cobol data divisions are generated with a 70% saving of programmer time. MIRACL/CPG also produces automatic documentation and error checking, while generating an errorless Cobol compile the first time.

What it can do for you.

MIRACL/CPG will ease your manpower scheduling problems while increasing programmer productivity. It reduces turnaround time. And helps you meet management deadlines.

A complete system.

Republic supplies you with all you need to put MIRACL/CPG to work in one day. The software, installation, onsite training, and maintenance. In fact, you even get a "hotline" to Republic's Customer Service Department, to help solve any application problem that might arise.

Already proven.

MIRACL was in development and testing for over two years. It was released earlier this year and has since been used by customers to write hundreds of programs. So it's already "debugged." And Republic, one of the major consulting firms in the field, stands behind it.

No competition.

MIRACL/CPG offers a combination of important features never before available. Like our ten-file input/output capacity, complete automatic documentation, and full Cobol compatibility. MIRACL/CPG produces more program with less coding.

Free demonstration.

We invite comparison. So we'd be delighted to run a free test of MIRACL/CPG for you. At your location. On your work. Once you see it in action, you'll be amazed at its power.

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Contracts

A \$2.5 million hardware/software contract has been awarded to Scientific Resources Corp. of Philadelphia by Globe Universal Sciences, Inc., Midland, Texas. Under the joint development program and marketing agreement, new seismic software developed by Globe would be marketed exclusively by Scientific Resources, and advanced systems concepts would be implemented by personnel of both organizations.

RCA is building a computer designed to meet government requirements for an airborne command post from which missiles and aircraft could be directed should ground control centers be destroyed. The Model 215 multiprocessor is suited for rugged military applications, and can operate over a wide temperature range.

The American Business and Commercial Life Insurance Co. of Dallas recently signed an electronic data processing facilities management contract with Computech System, Inc., also of Dallas. The two companies are planning to introduce a new application of electronic data processing to the insurance industry.

KMS Technology Center, a division of KMS Industries of Arlington, Va., has been selected by Nasa to handle data processing and analysis services at the National Space Science data center located at Goddard Space Flight Center, Greenbelt, Md. The contract is for one year at an estimated cost of \$1 million, with options for two successive one-year periods. During this time KMS will provide the necessary technical personnel and experience to manage systems operations for the Nasa center.

Goodway Copy Centers, Inc. has awarded a contract for the design of a total financial information system to Franchise Business Systems, a division of Computer Conversions, Inc. of Jenkintown, Pa. The system being developed will provide automated control over the accounting and financial reporting functions for each individual franchisee and for the investor-owned and company-owned copy centers. Investors will receive weekly and monthly reports showing sales, receipts, expenses, and the financial status of their operations. In addition, summaries of the statistics as well as exception reports will be provided to point out special trends and highlights.

Princeton Time Sharing Services, Inc. of Princeton, N.J., has disclosed the fulfillment of a contractual agreement with TCR Services Inc. of Englewood Cliffs, N.J. In the initial phase of the contract, PTSS assisted TCR in developing a set of proprietary computer programs that provide a means for retrieving information about more than 500,000 trademarks. PTSS also maintains and services TCR's trademark retrieval system, which consists of over 1/2 million records of about 300 characters each.

Under a \$2 million contract, Tracor Computing Corp. of Austin, Texas, will take responsibility for five years for all of National Western Life Insurance's data processing and computer activities, including systems consulting, planning, design, implementation, and operation.

Informatics Inc. of Sherman Oaks, Calif., has been awarded a contract from the Department of Transportation to develop a basis for a standardized transportation commodity description and coding system. Informatics will gather information for developing a common description and coding system to facilitate the interchange of commodities between different forms of transportation.

National Data Communications Contracts Honeywell, Raytheon for \$56.3 Million

LAS VEGAS—National Data Communications of Dallas has signed a contract totaling \$56.3 million with Honeywell Inc. and Raytheon Co. to purchase computer and communications equipment for controlling its hospital management systems. It is believed the largest such purchase ever made for communications data processing use.

Thomas W. Butler, chairman and chief executive of NDC, said the Honeywell contract, which amounts to \$36.8 million, is for 94 modified Model 516 computers, 50 high-speed printers, and 500 disk-drives, each capable of storing up to 9.4 million characters of information. The agreement with Raytheon is for

\$19.5 million of specially designed CRT units.

National Data will take delivery of the first of 47 systems in April 1970, with a completion date scheduled for June 1971. The contract brings to 50 the number of systems ordered from Honeywell, including three systems on an earlier contract.

The equipment will be used to make up 50 real-time electronic access communications for hospitals (Resch) systems. They will control patient scheduling, inventories, and scheduling of administrative hospital services.

The Raytheon contract, which will supply cathode ray tubes controls and test instruments is

"the largest single contract for digital-display terminals ever awarded," according to Dr. Joseph F. Shea, vice-president and general manager of the Raytheon equipment division. The duty-station terminals are the only instruments used by hospital personnel in operating the Resch system.

National Data will begin taking delivery of the previously ordered systems early in December. Each Resch system, which includes two Model 516s and a large number of CRT terminals, will be brought to operational status at Honeywell facilities in Massachusetts before delivery to its assigned hospital.

Unretouched photo.



Our disk pack.

Acquisitions

Elpac, Inc., Irvine, Calif., and these other firms have completed agreements in principle under which Elpac has, or will acquire subject to further approval of directors, the respective assets of each firm. The firms are: Beachcrest Estates, Inc., a state of Washington-based real estate and property management firm; Montclair Oil and Gas Corp., a West Virginia firm; and Eastern Basin Oil and Gas Co., a West Virginia natural resource firm. Elpac is an electronics firm that plans to expand further into the computer field.

Foto-Mem, Inc., Natick, Mass., has purchased Wilkinson Computer Sciences, Inc., at a cost of 10,000 shares of Foto-Mem

common stock, \$200,000 in cash, and the assumption of some limited liabilities. Foto-Mem is a small computer manufacturer that offers a line of computer peripheral hardware and systems.

Resource Management International of Amarillo, Texas, a holding company specializing in the management of agriculture resources, has agreed in principle to purchase International Agri-Venture from Computer Utilization Inc. of Austin, Texas. International Agri-Venture is a wholly owned subsidiary of Computer Utilization Inc., a computer and management consulting company.

University Computer Co., Dallas, Texas, a computer services organization, has acquired Computer Data Sciences Inc. of Cleveland, Ohio. Terms of the transaction were not reported. Computer Data Sciences specializes in computer programs and operating systems, and the development of a cathode ray tube typesetting service for the printing and publishing industries.

Information and Communication Applications, Inc., Silver Spring, Md., has purchased the assets and facilities of Data Power of New Orleans, a data conversion facility, for an undisclosed combination of stock and cash.

Orders and Installations

Three data terminals from Computer Consoles, Inc. (CCI) have been leased by Applications Technology, Inc., and Electronic Accounting Systems, Inc., both of Rochester, N.Y. Electronic Accounting Systems will use the CCI equipment in the implementation of a new payroll system that is being developed by Applications Technology.

Under a \$1 million contract, a large quantity of Varian R-622/ruggedized digital computers, from Varian Data Machines, have been selected as the process control computers in the Navy's avionics shop test system. Their function is to control automatic test equipment that is used to perform troubleshooting procedures on avionics equipment by

automatically isolating a fault down to the module level.

Applied Logic Corp., a time-sharing company with headquarters at Princeton, N.J., has ordered six IBM 2314 disk files worth \$1.5 million. The systems will offer high-speed performance to users on Applied Logic's AllCom time-sharing network.

The Danish Post Giro, the personal banking service operated by Denmark's Post Office, will enable three million Danish citizens to pay income taxes by payroll deductions, through the use of a large-scale computer-controlled, optical reading system. The electronic retinal computing reader, ordered from AB Recognition Equipment Industri, a Scandinavian subsidiary of Recognition Equipment, will handle the processing of the income taxes and other transactions.

The Gerber Scientific Instrument Co. of South Windsor, Conn., has installed the first of its 1275 automatic pattern generating and drafting systems at International Computer Graphics, Inc., Dallas. The main application of the new Gerber system is computerized grading of patterns and the production of full-size markers and mini-markers for the garment industry.

A Sigma 7 system, manufactured by Xerox Data Systems, has been installed by Data Computer Systems, Inc., New York, to expand its computer service capabilities. The system is now available to users in the New York metropolitan area for remote interactive batch processing and on-line resource sharing, through telephone connections from high-speed terminal devices in user offices, plants, and laboratories.

The Institute of Medical and Veterinary Science of South Australia has installed a Control Data 1700 for use in automating its pathology operations. The main function of the system will be to supply analytical data on specimens submitted by hospitals, clinics, and doctors.

The City of Buffalo has ordered a medium-scale GE-415 information system that features direct re-entry capabilities through a DRD-200 optical character reader. The automated re-entry of computer-generated documents will speed up data processing operations of the city significantly.

A \$400,000 Burroughs B300 computer system has been installed at the Milliken National Bank of Decatur, Ill., to handle general accounting operations.

Computer Transceiver Systems Inc. has delivered its first production-line Execuprot 300 to Mead Johnson Laboratories in Evansville, Ind. Mead Johnson has publicly announced plans to market a computer assisted diagnosis in the pediatrics program which will utilize the data communications terminal as the input/output instrument.



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CDC disk packs have a predicted usable lifetime of five years. If you buy something that's going to be around that long, it better be good.

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Main Problem of Sales Manpower Faces Western Union Service Bureau Franchise

By Sam Shetavsky
CW Correspondent

NEW HAVEN, Conn. — What's the outlook for a new EDF franchise after its first six months in operation?

"We haven't turned around yet, but can see profitability at the end of our first year," report Ralph Cobb and Tom Ricciardi, managers of Computer Utilities in Connecticut.

They are among the many new owners of Western Union's recently launched service bureau franchises.

With offices in Hartford and New Haven, their initial efforts centered on canvassing the small business market by direct mail and phone follow-up.

Personal calls on interested businesses established their "hot prospect" list.

"Our problems? Well, it's mainly sales manpower," answered Cobb. "The response has been so high that we just haven't been able to cover them all."

"Time has been divided between expediting hardware installation (IBM 360/20s due in first of the year) and sales follow-up."

"We added a systems man and salesman, the one-two punch we need to take the hardware load off our backs and give us the necessary customer covering power."

"This took us from a two-to-four-man operation."

"Six other service bureaus operate in this territory — independents and large organizations."

"But we have an edge with the extra service we offer — custom programming at no extra cost to the customer."

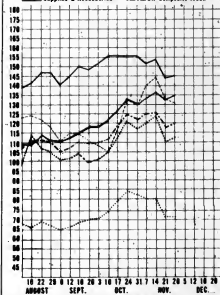
"We're backed up by Western Union application specialists working for us at headquarters in Fort Lauderdale."

"We have a package the other guys can't touch."

In spite of this initial shake-down period, they're already planning expansion with additional data centers in adjacent Fairfield and Westchester counties.

Computer Stocks Trading Index

Computer Systems Software & EDP Services
Peripherals & Subsystems Leasing Companies
Supplies & Accessories CW Composite Index



BASE FOR EACH TRADING INDEX: 100 as of 9/1/69

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Baltimore, Md. 21202

Graham Magnetics Has Confidence In SCC Comeback

NEW YORK — George A. Jagger, president of Graham Magnetics Inc., Graham, Texas, has issued a statement concerning the filing of a voluntary petition of bankruptcy under Chapter XI of the National Bankruptcy Act by Scientific Control Corp. of Carrollton, Texas. Graham Magnetics holds a \$1 million unsecured note on a loan made to Scientific Control.

Jagger said, "Graham Magnetics holds, at present, a note from Scientific Control Corp. in the amount of \$1 million for a loan made to that company on Aug. 11, 1969. That amount represents 20% of our \$5 million net worth."

"We strongly believe in the ability of Scientific Control Corp. to solve its present financial problems and meet its outstanding commitments."

"In the face of the announcement which affects us, Graham Magnetics now enjoys the strongest position in its history."

"Sales for the first four months of our present fiscal year, ended Oct. 31, 1969, rose to a record \$1,523,000 — an increase of 30% over the \$1,176,000 for the same period last year."

"Earnings for the first four months of 1969 increased to \$98,000, or 200% more than the \$31,000 shown in the similar 1968 period."

Levin-Townsend Computer Omits Payment of Dividend

NEW YORK — The board of directors of Levin-Townsend Computer Corp. has voted to omit the regular quarterly dividend on the common stock. Howard S. Levin, president, in announcing the decision, noted that the company had paid 30 cents a share on its common stock this year and 36 cents last year. He indicated that the dividend policy of the company would again be reviewed in the light of monetary conditions early next year.

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COMPUTER STOCKS: TRADING SUMMARY

WEEK ENDED NOV. 28, 1969

COMPUTER SYSTEMS									
EXCH	1969 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE
N	147-120	141	BURROUGHS CORP.	+ 8	5-73				
N	48-28	28 1/2	CABLE RADIO	+ 1	7-78	-4-18			
N	130-118	118 5/8	CONTROL DATA CORP.	+ 3	7-58	8-87			
N	180-175	175	DATA GENERAL CORP.	+ 3	7-58	8-87			
N	115-113	114 1/2	ELECTRONIC ASSOC.	- 1	5-18	-10-20			
N	11-8	8 1/2	HEWLETT-PACKARD CO.	+ 3/8	-7-10				
N	157-147	146 1/2	HONEYWELL INC.	+ 2	1-71				
N	130-129	131	IBM CORP.	+ 1	1-71				
N	157-158	154 1/4	WDC	+ 3	2-74	3-81			
N	44-35	36	RAYTHEON CO.	- 1	1-74	-4-80			
N	50-38	38	SCI. CONTROL CORP.	+ 3	2-74	3-81			
N	58-38	44 1/2	SPERRY RAND	+ 1	8-20				
A	58-26	26 1/2	SYSTEMS ENG. LABS.	+ 2	5-78	5-73			
PERIPHERALS & SUBSYSTEMS									
EXCH	1969 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE
N	85-59	54 1/4	ADDRESSOGRAPH-NELT	1	1-78	1-73			
O	71-13	14 3/4	ALPHAMERIC	- 1	1-74	-1-67			
N	49-30	30 1/2	ATLANTIC	- 2	7-78	8-13			
O	19-9	14 3/4	HOLTER-SERANED & NEW	---	---	---			
N	17-14	14	BINKER-RAND	---	---	---			
A	37-18	18 1/2	CALCOMP	- 1	1-78	8-13			
O	38-14	14 1/2	COINTEGRON	- 1	2-74	-10-84			
A	14-7	11 5/8	COMPUTER EQUIPMENT	- 1	1-78	4-49			
N	19-12	12	DATA PRODUCTS CORP.	3	1-78	2-80			
O	12-12	12	DATA RESEARCH	---	---	---			
N	83-43	39 1/2	ELECTRONIC S & H	3	7-84				
O	37-13	13 1/2	FABRIC	---	---	---			
O	21-13	13	FARRINGTON MFD	- 1	1-74	-5-54			
O	37-13	13	INFORMATION DIS.	- 1	1-78	-5-23			
A	12-12	12 1/2	NELO ELECTRONICS	---	---	---			
A	89-59	74 3/4	PHOTON DATA SCI.	---	---	---			
O	41-40	37 1/2	OPTICAL SCANNING	---	---	---			
O	31-18	18 1/2	PHIDAT	- 1	1-78	-4-97			
A	35-16	35 3/4	ROTEC INSTRUMENT	---	---	---			
O	74-54	64	RECOGNITION EQUIP.	---	---	---			
N	111-72	72 1/2	SCANDATA	---	---	---			
O	85-38	38	SCAN DATA	---	---	---			
O	38-18	18 1/2	TALLY CORP.	- 1	1-78	-5-63			
N	115-85	107 7/8	TRON CORP.	3	2-74	3-83			
SUPPLIES & ACCESSORIES									
EXCH	1969 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE
O	47-31	31	ACHE VISIBLE	---	---	---			
N	88-11	14 5/8	ADAMS-HILLIS CORP.	- 1	1-78	-3-71			
O	77-68	68 1/2	ATLANTIC BUS PAPER	---	---	---			
A	89-17	22 1/2	BARRY WRIGHT	---	---	---			
N	84-54	54	BUSS	---	---	---			
N	428-38	37 1/2	EMULS BUS PAPER	---	---	---			
N	173-63	171	HENDER	---	---	---			
O	118-74	113 1/2	CON COMPLY	---	---	---			
N	39-23	23 1/4	HODGE BUS PAPER	---	---	---			
N	82-26	26	MANU-CORP.	---	---	---			
O	46-38	38	REYNOLDS & REYNOLDS	---	---	---			
N	111-123	124	STANDARD ELECTRONIC	---	---	---			
O	34-25	34	UNIVERSAL	---	---	---			
N	115-72	72	WALLACE MAGNETICS	---	---	---			
O	37-28	28 1/2	WALLACE BUS PAPER	---	---	---			
SOFTWARE & TOP SERVICES									
EXCH	1969 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE
A	30-19	21 5/8	ADAPTED DATA TECH.	- 1	1-74	-1-84			
O	14-6	6	ANIS	---	---	---			
A	128-63	126	ANIMATED DATA PRG.	18	1-78	9-98			
O	15-7	7 1/2	AROMATIC APP. SYS.	---	---	---			
O	16-4	4 1/2	COMPUTER ENVIRON	---	---	---			
N	34-19	36	COMPUTER SCIENCES	---	---	---			
O	48-18	18 1/2	COMPUTER USER	---	---	---			
A	12-37	43 7/8	COMPUTER & SOFT	1	1-78	8-60			
O	24-4	5	DATAMATION SERVICE	---	---	---			
O	14-8	8 1/2	DATAPAC	---	---	---			
O	13-4	4 1/2	DIETEN	---	---	---			
O	30-12	12 1/2	EDUCATION PRG.	---	---	---			
O	30-12	12 1/2	INFORMATICS	---	---	---			
O	14-8	8 1/2	INSTRUMENTS	---	---	---			
O	28-4	4 3/4	INT. COMP. ANALYSTS	---	---	---			
O	21-8	8 1/2	MANAGEMENT RESEARCH	---	---	---			
O	11-7	7 1/2	PROGRESSIVE SYS.	---	---	---			
O	18-2	2	SOFTWARE SYSTEMS	---	---	---			
O	37-3	3 7/8	STATISTICS	---	---	---			
O	30-11	11	TRC CENT INC.	---	---	---			
O	14-8	8 1/2	UNIVERSITY CORP.	---	---	---			
A	15-7	7 1/2	U.S. TIME-SHARING	---	---	---			
LEASING COMPANIES									
EXCH	1969 RANGE	CLOSING PRICE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE	WEEK CHANGE	WEEK NET CHANGE
O	14-8	8 1/2	RASTER CONTIN.	---	---	---			
O	45-84	84	RENTAL COMPUTER	---	---	---			
O	18-4	4	COMPUTER EXCHANGE	---	---	---			
O	14-8	8 1/2	COMPUTER LEAS.	---	---	---			
A	68-23	23 1/2	DATA PRG. F & G	---	---	---			
O	14-8	8 1/2	DATA RESEARCH	---	---	---			
A	52-84	84	DEARBORN COMPUTER	---	---	---			
O	14-8	8 1/2	DATA RESEARCH	---	---	---			
A	25-16	16	GRANITE NET	---	---	---			
O	18-12	12	LEASING COMPUTER	---	---	---			
A	14-8	8 1/2	LEASING DATA PRG.	---	---	---			
O	4-8	8 1/2	LECTRO COM LEAS.	---	---	---			
A	37-28	28 1/2	LEVIN-TOWNSEND CORP.	3	1-74	-1-84			
O	8-2	2	LEASING DATA PRG.	---	---	---			
O	14-8	8 1/2	MANAGEMENT RESEARCH	---	---	---			
O	18-6	6	NO. LEASING	---	---	---			
A	34-2	2 1/2	SYSTEMS ENGINEERING	---	---	---			
A	28-13	13	U.S. LEASING	---	---	---			

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Earnings Reports

ALPHANUMERIC, INC.
Three Months Ended Sept. 30
1969 1968
Shr Emd \$8.01
Revenue 901,995 282,231
Earnings 38,333 (341,614)
(Loss) on a fully diluted basis.

ARIES CORP.
Three Months Ended Sept. 30
1969 1968
Shr Emd \$8.08
Revenue 1,329,539
Earnings 87,731
a-Not available as the company has changed from a calendar year to a fiscal year ending June 30.

ASTRODATA INC.
Three Months Ended Sept. 30
1969 1968
Shr Emd \$8.07
Revenue 6,382,000 5,654,000
Earnings (Loss) 325,000 (13,000)
G.Mo Shr \$12
Revenue 10,350,000 10,343,000
(Loss) 554,000 (191,000)
a-Based on income before tax credit; b-Equal to 14 cents a share in the quarter and 24 cents a share in the six months.

BANISTER CONTINENTAL CORP.
Six Months Ended Sept. 30
1969 1968
Shr Emd \$8.29
Revenue 14,706,000 1,836,000
Earnings 652,000 175,000
a-The report states that, assuming full dilution, share earnings were 36 cents in the 1969 period and 10 cents in the 1968 period.

CALIFORNIA COMPUTER PRODUCTS
Three Months Ended Sept. 29
1969 1968
Shr Emd \$8.04
Revenue 4,959,736 4,353,666
Earnings 502,740 324,489
a-Retained to include business acquired in pooling of interest in 1968; b-After \$99,420 deduction for the company's share of this quarter's losses by an affiliate formed in Oct. 1969.

COMPUTER LEASING CORP.
Nine Months Ended Sept. 30
1969 1968
Shr Emd \$8.44
Revenue 40,437,000 21,425,000
Earnings 2,329,000 2,358,000
a-Based on average common shares and common share equivalents, as reported by the company; b-Retained to reflect acquisitions made on pooling-interest basis.

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COMPUTER USAGE CO.
Year Ended Sept. 30
1968 1969
Revenue 11,466,202 13,609,996
Spec Cred \$52,605
Loss 1,536,886 432,362
a-Data on sale of property.

DATAMATION SERVICES, INC.
Nine Months Ended Sept. 30
1969 1968
Shr Emd (Loss) \$1.10
Revenue 2,647,161 4,097,560
Earnings (176,415) 184,958
a-Reflects the acquisition of CSEC on March 7, 1969, on a pooling-of-interest basis. This report is unaudited.

ELECTRONIC COMP. PROG. INST.
Nine Months Ended Sept. 30
1969 1968
Shr Emd \$8.08
Revenue 2,341,160 2,645,952
Spec Cred 107,173
Earnings 43,970 843,904
a-Based on income before special credit; b-Equal to 57 cents a share.

FINMAC CORP.
Nine Months Ended Sept. 30
1969 1968
Shr Emd \$8.04
Revenue 1,469,010 1,367,771
Earnings 25,349 22,725

VERMONT RESEARCH CORP.
Year Ended Sept. 30
1969 1968
Shr Emd \$8.30
Revenue 4,183,792 2,444,041
Earnings 221,650 44,732

LEVIN TOWNSEND COMPUTER SYSTEMS
Six Months Ended Sept. 30
1969 1968
Shr Emd \$8.04
Revenue 31,102 48,124
Earnings 22,222 22,222
Spec Cred 999,708
Earnings 3,594,650 5,196,789
a-Reported by company and based on common and common share equivalents; b-Retained for the acquisitions of National Equities Inc., purchased as of Aug. 1, 1966, and Russell M. Tolley & Associates Inc., acquired on a pooling-of-interest basis in Oct. 1968; c-Based on income before special credit; d-Net gain on sale of investments; e-Equal to \$1.52 a share.
The company says that earnings per common share, assuming full dilution amounted to \$1.05 in the 1969 period and to \$1.04 per share in the 1968 period before the net gain on sale of investments and to \$1.52 after such adjustment.

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ROBINS INDUSTRIES CORP.
Three Months Ended Sept. 30
1969 1968
Shr Emd \$8.11
Revenue 727,111 587,081
Earnings 45,661 32,482
9 Mo Shr 245
Revenue 2,004,184 1,884,991
Earnings 104,503 95,472
a-This report is unaudited.

SCIENTIFIC CONTROL CORP.
Three Months Ended July 31
1969 1968
Shr Emd \$8.06
Revenue 2,451,464 2,245,734
Earnings (11,556,100) 69,499
a-Retained to reflect acquisitions on a pooling-of-interest basis.

SYSTEMS CAPITAL CORP.
Nine Months Ended Sept. 30
1969 1968
Shr Emd \$8.16
Revenue 3,900,000
Earnings 592,302
a-Comparable figure not available.

TALLY CORP.
Nine Months Ended Sept. 30
1969 1968
Shr Emd \$8.06
Revenue 7,265,973 6,776,629
(Loss) (1,734,086) 241,123

VARIAN ASSOCIATES
Year Ended Sept. 30
1969 1968
Shr Emd \$8.91
Revenue 186,172,000 170,735,000
Spec Cred \$3,026,000
Earnings 27,044,000 3,443,000
a-Based on income before special credit; b-From sale of building; c-Equal to \$1.06 a share.

PROGRAMMING METHODS INC.
Nine Months Ended Sept. 30
1969 1968
Shr Emd \$8.34
Revenue 3,178,946 1,591,004
Earnings 284,801 186,548

HATHAWAY INSTRUMENTS, INC.
Three Months Ended Sept. 30
1969 1968
Shr Emd \$8.14
Revenue 1,261,139 1,130,197
Earnings 113,674 77,201

BARNES CORP.
Three Months Ended Sept. 30
1969 1968
Shr Emd \$8.10
Revenue 891,876 646,633
Earnings 49,707 50,663

ADVANCED COMPUTER SOFTWARE SERVICES, INC. 280 Park Ave. S. New York, N.Y. 10003, a company that intends to become involved in time-sharing programming systems, proprietary program development, and data processing control services, filed to register 130,000 shares of common stock. Proceeds, at \$5 per share maximum, intended for the design, development, marketing, and servicing of computer utility systems; for expanding and marketing consulting services; for working capital; and general corporate purposes. The underwriter is First Securities Corp. of N.C., 80 Broad St., New York, N.Y. 10004.

COMPUTING EFFICIENCY, INC. 98 E. Industry Court, Dear Park, N.Y. 11729, a company that produces and markets proprietary software and provides computer facilities management services, filed to register 300,000 shares of common stock. Proceeds, at \$15 per share maximum, intended for renting and maintaining additional plant and office space, for wiring and maintaining the regional offices; for additional personnel;

for leasing an IBM 380/40 computer, auxiliary equipment, and related services; for developing new proprietary products and additional services; for establishing and maintaining a wholly owned subsidiary to produce and assemble the physical and logical components of proprietary software products for general funds, and general corporate purposes. The underwriter is First Securities Corp. of N.C., 80 Broad St., New York, N.Y. 10004.

VIATRON COMPUTER SYSTEMS CORP. Bedford, Mass. 01730, a company engaged primarily in the design, development, assembly, and marketing of data processing devices, filed to register \$28 million of convertible subordinated debentures, due 1989. Proceeds intended to finance equipment leased to customers; to purchase machinery and equipment; to pay for costs and expenses, including the payment of interest on the debentures. The underwriter is Shields & Co. Inc., 44 Wall St., New York, N.Y.

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Charles E. Frasier Heads Staff at ISD

KANSAS CITY, Mo., — Charles E. Frasier has been appointed president and chief executive officer of Information Systems Development, Inc., a recently formed management information systems company.

Frasier started his computer-based management career with RCA in 1957. At RCA he progressed to Kansas City district systems representative. He also gained additional sales and management experience in 1964 with Honeywell.

Frasier, formerly director of corporate systems for Black, Swails & Bryson, Inc., of Kansas City, will head a staff of over 35 ISD computer management consultants and specialists.

Information Systems Development, Inc. is an independent firm that offers services in the formulation, development, and implementation of computer-based management information

systems.

ISD services include management consulting, installation management; design, development and implementation of management information systems; state and local government

management systems; urban and regional planning information systems, application packages; real-time process control and surveillance; computer-based social science research and other planning studies.

Kuemmerle Joins IRC as President

NEW YORK — John F. Kuemmerle has been elected president and also a director of Installation and Research Corp., an electronic data processing company that offers, among other services, a computer output microfilm system for the conversion of data information directly from magnetic tape to film.

Kuemmerle succeeds Aaron Lieber as the company's president.

Prior to joining Installations and Research, Kuemmerle was a vice-president of the J. Henry

Schroder Banking Corp. and the Schroder Trust Co. Previous to that he was a director of systems and data processing for the American Express Co., and a corporate manager of systems at Merck & Co., Inc.

He is on the board of directors of Northwest Electronics Co. and St. Anthony Printing Co., and recently resigned as a member of both the board and the executive and finance committee of Randomatic Data Systems, Inc. of Trenton, N.J.

Konkel to Serve ISL as Chief Executive

JENKINTOWN, Pa. — Paul E. Konkel has joined Information Systems Leasing Corp. as executive vice-president and general manager, and will serve as chief executive officer of the corporation.

Konkel has an extensive background in the data processing industry, including experience in systems design and development, facilities management, and marketing. He has been in the EDP field for some 14 years.

He had been district manager in the New York area for Computer Usage Corp. prior to joining Information Systems Leasing Corp.

Information Systems Leasing Corp., headquartered in the Philadelphia area, provides a large range of data processing products and services.



COMPUTERWORLD

EDPeople

Digicon Advances 3 VPs

HOUSTON, Texas — Digicon, Inc. has advanced vice-presidents Patrick H. Poe and Edward R. Prince Jr. to senior vice-presidents, and named Rolando Lara and John Sherwood vice-presidents.

In his new position, Poe will be in charge of computer operations for the Houston-based geophysical company. He has been engaged in work with computers for the last 10 years, specializing in seismic and geophysical applications.

He is one of the founders of Digicon, and was responsible for the development of the company's seismic digital data processing system.

Prince will direct all field operations for Digicon. He has been involved in geophysics since 1960, and has had wide experience in field operations. Rolando Lara, former manager of South American operations, will enlarge his area of responsibilities to include the Far East, Australia and Latin America. He joined Digicon in 1969.

Prior to this association he had had 15 years experience in geophysics with Standard Oil Co. of Calif.

John Sherwood joined Digicon earlier this year as a senior scientist. He came to the company from Chevron Oil Field Research Co. where for 11 years he was senior research associate in geophysics with Standard Oil Co. of Calif.

Krumbach Joins Data Devices Div. of Astrodata

ANAHEIM, Calif. — Guenther F. Krumbach has been appointed senior design specialist for Astrodata's data devices division. Prior to joining Astrodata,

Krumbach was project manager of Raytheon Computer Co. in Santa Ana and Los Angeles. Earlier he was project engineer for Benson Lehnert Corp.

Executive Corner

At Raytheon he directed a program to design a computer-controlled photo-composition system for the Times-Mirror Press and earlier in Germany developed the logic design for the first transistorized computer in Germany, the FR-56.

Astrodata's data devices division was organized in December to develop and market computer peripheral equipment for the electronic data processing field.

Other Moves

International Data Corp., Newton, Mass., has appointed Walter E. Misdom as director for industry analysis. He will provide interpretation and forecasts from a worldwide data base on computer installations maintained by IDC.

AST Tabulating Corp., Lake Bluff, Ill., has announced the selection of Mac Jacobs as a vice-president of the corporation.

REPS. ADDRESSES

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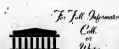
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